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L'EXPLORATION DE LA MER

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ET
PROCÈS-VERBAUX DES RÉUNIONS

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VINGTIÈME RÉUNION

COPENHAGUE ET STOCKHOLM — MAI 1927

BUREAU DU CONSEIL:

M. H. G. Maurice, Président du Conseil.
M. Otto Pettersson, Vice-Président du Conseil.
M. J. Hjort, Vice-Président du Conseil.
M. Th. Tissier, Vice-Président du Conseil.
M. C. Heinrici, Vice-Président du Conseil.

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et leurs adresses:

Allemagne: M. le Dr. C. Heinrici, Secrétaire d'Etat à disposition, Président de la Commission scientifique allemande pour l'Exploration de la Mer, Potsdamerstrasse 22a, *Berlin.*

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Experts: Professor D'Arcy W. Thompson, C. B., F. R. S., The University, *St. Andrews.*

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Mr. J. O. Borley, O. B. E., Fisheries Laboratory, *Lowestoft.*

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†† retenu à Paris pour cause de maladie.
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** N'a pas assisté à la réunion.

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M. le Professeur V. W. Ekman, à l'Université, *Lund.*

Invités: M. le Prof. V. Volterra, Senateur, Président de la Commission Internationale de la Méditerranée, *Rome.*
M. le Prof. V. Bjerknes, *Bergen.*

* N'a pas assisté à la réunion.
** retenu pour cause de maladie.

AGENDA

for the twentieth meeting of the International Council for the Exploration of the Sea

(Stockholm, May, 1927)

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1. Assembly at Riddarholmskyrkan, where a wreath will be laid on King Oscar's tomb, after which the Council will return to Riddarhuset.
2. Reception of the King and opening of the Proceedings.
3. Report by the President as to the present participation, and to the adherence for a further period of five years.
4. Administrative Report.
5. Reorganization of the Bureau. Resolution to be moved by the President in accordance with notice already given.
6. Proposal for filling vacancy in the Bureau. Proposal by M. Tissier.
7. Final Approval of the Accounts for 1925—26.
8. Statement of Accounts for 1926—27 per $^{31}/_{3}$.
9. Proposal by the President concerning a pension for Mrs. Drechsel.
10. Discussion of publication of a special volume in celebration of the 25th Anniversary of the Council.
11. Arrangements for Committee meetings.
12. Consideration of the Reports and Programmes of the Committees.
13. Estimates for the financial year 1927—28.
14. Nomination of the members of the Bureau, the Finance Committee, the Editorial Committee, and the Editors, etc.
15. Time and place for the next Council meeting.
16. Other business.

REPORT

of

the 20th Meeting of the Council.

The 20th Meeting of the Council, which began on May 27th, was held, by the kind invitation of the Swedish Government, at Stockholm. The Council thus, while celebrating the 25th Anniversary of its foundation, bore testimony to the fact that it owed its existence to the initiative of the late King Oscar II of Sweden, who summoned, in 1899 at Stockholm, the first of the two Conferences which led up to the foundation of the Council in 1902.

The Bureau and the Statistical, Consultative, Whaling and Limnological Committees met in Copenhagen on May 23rd to 25th, and, a very considerable part of the Council being thus assembled at their headquarters in Copenhagen, the Danish Government took the opportunity to entertain them at a dinner, where most cordial references were made by the Minister for Foreign Affairs to the work of the Council and the relation with it of the Danish Government. H. M. the King of Denmark also honoured the Members of the Bureau by receiving them in special audience, and expressed to them his interest in the work of the Council and his wishes for its successful progress.

At Stockholm, the Council had the honour of being received at the Royal Palace by H. M. King Gustaf V. They were also most hospitably entertained by the Swedish Commission and by the Municipality of Stockholm.

On May 27th at 11 a.m. the Council assembled at the Riddarholmskyrkan in Stockholm, where a wreath was deposited at the tomb of King Oscar II.

Inaugural Meeting.

A special inaugural meeting of the Council was held at the Riddarhus, where His Majesty King Gustaf, accompanied by Members of the Royal Family, was graciously pleased to be present. Governor von Sydow, President of the Swedish Fisheries Commission, spoke as follows:—

Sire, Monseigneur, Madame, Mesdames et Messieurs,

L'organisation internationale, dont les éminentes personnalités dirigeantes s'assemblent aujourd'hui en cette ville, doit sa fondation — qu'il me soit permis de le constater avec un certain sentiment de fierté nationale — à une initiative suédoise.

C'est, en effet, sur l'invitation du Gouvernement suédois qu'au mois de juin 1899 des délégués des Gouvernements allemand, britannique, danois, néerlandais, norvégien et russe se sont réunis en conférence avec des représentants du Gouvernement suédois, afin d'arrêter dans ses grandes lignes un programme d'exploration internationale, au double point de vue hydrographique et biologique, de la partie septentrionale de l'océan Atlantique, ainsi que de la mer du Nord et de la mer Baltique. Il s'agissait, non seulement d'enrichir le trésor de nos connaissances de faits nouveaux, mais aussi de réaliser les conditions nécessaires à l'adoption d'une législation commune relative à la pêche maritime et aux méthodes rationnelles à appliquer pour l'exercice de cette pêche.

La conférence aboutit aussi à l'établissement d'un programme préliminaire de recherches, que compléta et précisa en 1901 une seconde conférence tenue à Christiania — ou, comme nous dirions aujourd'hui, Oslo. Et c'est ainsi qu'une troisième conférence, réunie à Copenhague au mois de juillet 1902, put donner à l'Organisation internationale pour l'Exploration de la Mer sa constitution définitive.

Il me sera peut-être permis de rappeler à cette occasion que — suivant le témoignage d'hommes qui ont assisté aux débuts de l'œuvre — feu S. M. le Roi Oscar portait à l'idée de cette entreprise et à sa réalisation l'intérêt le plus personnel et le plus vivant. Le fait n'a rien, d'ailleurs, qui puisse nous surprendre. Le Roi Oscar, qui possédait lui-même une culture étendue, s'est toujours montré un fervent ami des sciences et prêtait généreusement son puissant appui aux chercheurs et à tous les efforts ayant pour objet d'élargir le domaine du savoir humain. Aussi éprouvons-nous le besoin de rendre à sa mémoire un hommage ému et reconnaissant.

C'est une grande joie pour notre organisation internationale de voir que le fils du Roi Oscar, son successeur sur le trône de la Suède, continue les nobles traditions de Son Auguste Père et daigne honorer cette réunion de Sa présence. Que Votre Majesté me permette de Lui exprimer l'humble gratitude de la Commission suédoise pour l'Exploration de la Mer, pour cette marque précieuse de Sa bienveillance.

Nous présentons également aux autres membres de la Famille Royale ici présents l'expression de notre respectueuse reconnaissance pour l'honneur que veulent bien nous faire Leurs Altesses Royales en assistant à cette séance inaugurale.

Des savants suédois qui, les premiers, ont conçu l'idée de cette organisation internationale, deux, M. le Professeur Pettersson et M. le Dr. Gustaf Ekman, sont encore en vie. C'est un plaisir pour nous tous de voir au milieu de nous ces

vétérans de la science océanographique. Nous sommes d'autant plus heureux de leur présence qu'elle nous permet de constater que, malgré les années, ils n'ont rien perdu de la juvénile ardeur avec laquelle ils contribuent aux progrès de cette science.

Je constatais, il y a un instant, que l'Organisation internationale pour l'Exploration de la Mer s'est constituée en 1902. C'est dire qu'elle est à l'œuvre depuis un quart de siècle déjà.

Lorsqu'en 1925 son organe directeur, le Conseil permanent pour l'Exploration de la Mer tint son assemblée annuelle, des délégués étrangers proposèrent que l'assemblée de 1927 eût lieu à Stockholm, afin que le vingt-cinquième anniversaire de l'inauguration des travaux pût être célébré dans cette ville. Cette proposition fut accueillie en Suède avec enthousiasme. On y voyait un hommage rendu à notre pays, à son opportune et féconde initiative et à sa contribution à l'œuvre commune. On attachait le plus grand prix à l'honneur de recevoir dans la capitale de la Suède une assemblée si nombreuse et si brillante de savants venus de tant de pays divers.

Aussi le Gouvernement suédois, d'accord avec le Parlement (Riksdag), résolut-il de charger la Commission suédoise pour l'Exploration de la Mer d'inviter le Conseil à se réunir à Stockholm. Et c'est ainsi que l'honneur m'échoit aujourd'hui, Mesdames et Messieurs, de vous souhaiter, au nom de notre Gouvernement et en ma qualité de président de la Commission suédoise, une cordiale bienvenue dans ce pays et dans cette ville.

Je salue tout d'abord ici le président du Conseil permanent, Mr. Maurice, délégué de l'Angleterre, qui, depuis bien des années, dirige avec l'autorité d'une longue expérience et avec un si remarquable succès, les destinées de notre organisation internationale.

Nous avons le privilège aussi de voir parmi nous quelques-uns des délégués étrangers qui assistaient déjà à la première Conférence de Stockholm: ce sont Messieurs D'Arcy Thompson, Hjort et Knudsen. Nous aimons à penser, en ce qui les concerne, que le plaisir du revoir est réciproque.

Nous adressons enfin un salut très cordial à tous les participants à la Conférence qui nous réunit aujourd'hui, délégués, experts et autres personnes s'intéressant à quelque titre aux travaux d'exploration de la mer.

Il n'entre pas dans mon dessein de tenter une récapitulation des résultats obtenus durant les 25 ans qui viennent de s'écouler. Je suis trop peu versé dans la matière pour songer à anticiper sur ce que pourra vous dire sur ce sujet M. le Président du Conseil international. Qu'il me soit seulement permis de constater que les travaux se sont poursuivis pendant tout le cours de ces 25 années, bien qu'ils aient subi des perturbations du fait de la Grande Guerre. Depuis la conclusion de la paix, leur champ s'est considérablement élargi: le nombre des Etats européens affiliés à l'organisation est aujourd'hui de 15. Les libres échanges d'idées et les rapports personnels entre savants de différents pays, qui sont la condition

nécessaire du succès dans toutes les branches de l'activité scientifique, sont heureusement rétablis dans le domaine de l'océanographie. L'isolement a pris fin. Notre organisation réalise l'universalité. Il n'y a place dans son sein, à l'exclusion de toute rivalité, que pour une noble émulation dans la poursuite du même but.

L'océanographie est une science relativement jeune. Déjà pourtant, un grand nombre des secrets que recèlent les mers et leurs profondeurs, nous ont été révélés. Dans ce domaine aussi, les limites du savoir humain reculent de jour en jour. Cet accroissement de nos connaissances constitue par lui-même un progrès de la civilisation. Mais, comme je le disais tout à l'heure, la science qui nous occupe se propose aussi des objectifs tout pratiques.

Et il est apparu, en effet, que les recherches hydrographiques et biologiques systématiquement poursuivies d'année en année sont à cet égard de la plus haute importance.

La connaissance des courants maritimes, des variations auxquelles sont soumises la température et la salinité des eaux de la mer, des conditions d'existence et d'alimentation des poissons, de la lutte pour la vie dont les profondeurs de l'océan aussi sont le théâtre, la connaissance de ces phénomènes et d'autres du même domaine nous met en mesure de régler d'une façon plus rationelle, par la voie législative, la pêche maritime et de donner aux populations qui l'exercent des indications utiles sur les lieux et les temps les plus favorables à la capture du poisson. Les investigations des savants nous ont aidé encore à perfectionner les méthodes de pêche et à reconnaître les engins dont il convenait de prohiber l'emploi en raison de leur caractère destructeur.

Comme représentant d'une province suédoise où la pêche maritime joue un grand rôle et a une importance extrême, je tiens à adresser à la Commission internationale des remerciements chaleureux pour l'œuvre qu'elle accomplit, en vue d'assurer une meilleure exploitation d'une richesse nationale qui procure leur subsistance à de nombreuses familles de pêcheurs et met à la disposition des populations un aliment à la fois nourrissant et peu coûteux.

Des questions importantes figurent à l'ordre du jour de la session qui s'ouvre aujourd'hui. Permettez-moi donc, en terminant, de former les meilleurs vœux pour le succès de vos travaux et d'exprimer l'espoir que le séjour de nos amis étrangers sous notre ciel septentrional leur laissera des souvenirs à tous égards agréables.

Et maintenant, je cède la parole au Président du Conseil international, Mr. Maurice.

The President replied in the following terms:—

Que Votre Majesté veuille bien me permettre de Lui exprimer, au nom de tous les membres du Conseil International pour l'Exploration de la Mer, les sentiments de respectueuse et profonde gratitude qu'ils éprouvent grâce à l'insigne

faveur qu'Elle a accepté de nous témoigner par Sa présence à la séance d'ouverture de cette réunion, qui marque la 25ème année d'existence de notre Conseil.

Sire,

Je peux déclarer que la maison royale de Suède est particulièrement vénérée par les membres du Conseil International, car aucun d'eux n'ignore que le premier fondateur de cette institution, que celui qui fut le promoteur de la 1ère conférence à Stockholm n'était autre que Votre Auguste Père, Sa Majesté Oscar II. C'était un pieux devoir pour nous d'aller saluer son tombeau et c'est avec recueillement, que nous avons évoqué sa mémoire.

Notre venue ici, Sire, marque l'accomplissement d'un devoir.

Sa Majesté Oscar II nous avait donné une mission à remplir.

Vingt-cinq ans ont passé; nous revenons à Stockholm rendre compte à son fils que nous n'avons pas failli à notre tâche.

Monseigneur, Madame,

Je m'incline avec respect devant Vos Altesses Royales et Les remercie d'avoir bien voulu assister à cette séance jubilaire.

Excellence,

Les paroles que vous avez prononcées tout à l'heure m'ont profondément touché aussi que tous mes collègues du Conseil: elles montrent que vous appréciez nos travaux que vous connaissez comme président de la Commission suédoise, bien que votre modestie s'en défend, et c'est une grande satisfaction pour nous de savoir que l'on a suivi avec bienveillance nos efforts dans le pays qui a vu notre origine.

Mesdames, Messieurs,

En présence de Sa Majesté, de Leurs Altesses Royales et devant les représentants du Gouvernement suédois, je répéterai les paroles d'un de mes compatriotes, Sir John Murray, délégué britannique à la conférence de 1899:

"Sa Majesté le Roi Oscar et son peuple", dit-il, "seront toujours honorés pour avoir pris l'initiative d'organiser l'étude méthodique des sciences de la mer".

Le Conseil International est vraiment d'origine scandinave: c'est une plante, qui a été semée en Suède, qui a germé en Norvège, qui a fleuri en Danemark.

Son Excellence me priait d'indiquer les résultats de nos travaux achevés pendant les 25 années écoulées; je ne peux pas en faire un exposé technique, car il faudrait plusieures heures même pour en fournir un aperçu rapide. Les publications du Conseil constituent, à elles seules, une véritable bibliothèque, où l'on rencontre associés les noms de tous les océanographes éminents d'Europe: c'est une véritable encyclopédie des sciences biologiques maritimes. La zone d'investigation étudiée s'étend chaque jour et comprend tout le Nord-Atlantique, la Mer du Nord, la Baltique.

Les études générales de science pure ont servi de préparer aux études appliquées. Le Conseil a toujours travaillé en vue de résultats pratiques: les poissons

auxquels il a consacré ses travaux sont ceux mêmes qui servent de base à l'alimentation européenne: le hareng, la morue, l'églefin, la plie, le merlu, le thon etc. Certains d'entre eux commencent à être admirablement connus, nous avons des données sur leur croissance, leurs migrations, leur nourriture, et nous arrivons même par d'ingénieuses méthodes à calculer leur abondance dans les profondeurs de la mer.

La connaissance du milieu où ces animaux évoluent s'est bien perfectionnée: l'étude méthodique des températures, des salinités, de la distribution du plancton, nous ont amenés à distinguer certaines lois générales qui président à la biologie des poissons comestibles. L'étude de la mer et du monde marin est infinie et nous ne pouvons prétendre qu'à en avoir des notions sommaires; encore pour acquérir ces notions a-t-il fallu le travail de tous les instants, qu'ont effectué depuis un quart de siècle les savants du Conseil International.

Nous commençons déjà à recueillir le bénéfice de leur labeur quand il s'agit d'apporter des bases sérieuses à la législation de la pêche: leurs observations sont un guide sûr pour l'exploitation rationelle des richesses de la mer. J'ajouterai qu'en plus de l'obtention de tous ces résultats, le Conseil International a un autre mérite: celui de grouper dans un même labeur désintéressé des hommes éminents de toutes les nations. Cette collaboration vers un même idéal, l'amélioration des conditions économiques de tous les peuples, est aussi un des titres de gloire du Conseil.

Conscients de la valeur de nos recherches, nous apprécions avec certitude l'idée qui a permis ce groupement international et toute notre reconnaissance va à la Suède qui l'a conçue et en a facilité l'application, et aussi aux hommes éminents, nos collègues Otto Pettersson et Gustaf Ekman, qui dès l'origine ont été dans notre Conseil les représentants de ce pays.

Nous avons célébré le passé, il faut songer à l'avenir et nous mettre au travail, en conséquence j'ai l'honneur, Sire, de demander à Votre Majesté la permission de déclarer ouverte la présente session plenière du Conseil International.

His Majesty and the Members of the Royal Family having retired, the meeting was adjourned to the afternoon.

First Sitting: Friday, May 27th, at 2,45 p. m.

The President, Mr. Maurice, in the chair.

Present: The members and experts (vide list pp. 4—7).

On the resumption of the meeting at 2.45 — the lady visitors of the Council being present for the opening speeches, by invitation — the President spoke as follows:—

Messieurs les Délégués et Experts,

J'ai déjà eu l'honneur d'ouvrir devant S. M. le Roi de Suède la XX^{e} session du Conseil International. J'ai tâché d'exprimer à ce Souverain notre gratitude pour l'intérêt qu'il a témoigné à notre Conseil par son auguste présence. Mais, conformément à notre coutume, je vous demanderai de transmettre à notre hôte habituel, je veux dire, à S. M. le Roi de Danemark un télegramme pour marquer notre respectueuse déférence à son égard.

Je souhaite la bienvenue à nos collègues de la délégation allemande parmi les membres de laquelle j'ai plaisir de voir MM. les Professeurs Brandt, Ehrenbaum, Henking et Schott. C'est avec grand plaisir que je salue M. le Professeur Mielck comme délégué de son pays. De même je suis heureux de saluer dans la délégation espagnole M. le Capitaine de Vaisseau Sebastian Noval et les ingénieurs qui prennent part pour la première fois à nos séances. Je signale également le plaisir que j'ai à saluer comme délégué des Pays-Bas, Monsieur van Riel et de la Belgique Monsieur Verbrugghe, et à retrouver, comme délégué du Portugal, le Docteur Ramalho. Je me permets de saluer avec une chaleur tout à fait particulière notre ami bien aimé Johannes Schmidt qui siège avec nous pour la première fois comme délégué du Danemark. Je tiens à associer à ces vœux de bienvenue deux nouveaux experts: M. Välikangas, pour la Finlande, M. Savage, pour la Grande Bretagne.

L'année dernière, j'avais reçu de la Commission Internationale pour l'Exploration scientifique de la Mer Méditerranée une aimable invitation d'aller assister dans le cadre superbe de Venise aux travaux de cette commission. Son Président, M. le Senateur et Professeur Volterra me réservait un très cordial accueil. Aujourd'hui j'ai la très grande satisfaction de le recevoir à mon tour dans la Venise du Nord et de lui témoigner au nom du Conseil International toute notre sympathie pour son éminente personalité scientifique et pour la commission qu'il préside avec authorité et distinction. Nous avons d'autres hôtes que je me plais à saluer et en excusant de ne pouvoir les nommer tous.

Messieurs les Délégués du Royaume d'Italie, vous êtes ici les bienvenus. Votre présence parmi nous est le signe de la prospérité des pêcheurs de votre pays: longtemps limitées à la Mer Méditerranée, les pêches italiennes s'étendent maintenant jusque dans les mers septentrionales. M. le Professeur Magrini, il m'est tout à fait agréable après vous avoir salué l'année dernière comme un visiteur assistant à nos séances de Copenhague, de pouvoir vous souhaiter cette année la bienvenue comme délégué de votre Gouvernement. J'adresse les mêmes souhaits au Commandant Cattani de la Marine Italienne.

Nous célébrons ici le 25ème anniversaire du Conseil: mais tandis que notre commission avance en âge, elle doit, hélas! payer à la mort un lourd tribut: cette année même a été marqué par la disparition de deux de nos amis.

Tous les membres du Conseil ont appri avec peine la mort du Senateur

HAMMAN, qui fut délégué de la Belgique pendant de longues années; tous ceux qui l'ont connu appréciaient sa bienveillance et sa charmante bonhomie. Représentant au Parlement de Belgique d'une circonscription maritime sa vie a été intimement liée aux choses de la mer et à nos recherches. Je demande en notre nom de tous, à Monsieur le Professeur GILSON, son ami, de transmettre à sa famille nos condoléances émues.

L'autre deuil est non moins profond pour le Conseil car il marque une place vide, tout près de moi. Depuis que j'ai l'honneur d'occuper le fauteuil du Président, j'avais l'habitude à tous nos séances de sentir à mes côtés notre fidèle et dévoué Secrétaire Général. Cette place est vide maintenant et tous nous en souffrons. Nous nous rappelons le rôle que le Commandant DRECHSEL a joué dans la fondation et le développement du Conseil International; nous savons les efforts qu'il a fait pour maintenir cette institution dans les moments graves de la grande guerre; et comment il était arrivé à incarner une partie de l'âme du Conseil: même dans ses derniers moments, il ne pensait qu'à cette séance, à laquelle il avait tant désiré assister.

Gentlemen, I have endeavoured to express in a few words the feelings of all of us, members of the International Council, with regard to our late General Secretary; but I will ask you to be patient with me for a few moments while I speak of him as my personal friend.

From the moment when I became first acquainted with the Council, in 1912, to the day of his death, I had reason to be grateful to DRECHSEL. When the work of the Council was to me an unknown field and its members all strangers, DRECHSEL, with that invariable courtesy which all of us have known so well, did everything that a man could do to smooth my path. Later, in the turmoil of the war, we worked together to keep the machinery of the Council intact. After the war, when you honoured me by electing me as your President, he gave me the support and advice of an old soldier training a tyro. And, as time went on, I learned and appreciated more and more from year to year the sterling worth of this man who was in the best sense what we in England speak of as an officer and a gentleman.

Since I learned of his unexpected death, whenever I have thought of him — and he has been constantly in my thoughts — a sentence from a famous funeral oration written by our most famous English poet has constantly been present to my mind — a sentence which in a few words says all that I feel about DRECHSEL "He was my friend, faithful and just to me". What better could one man say of another. Friend, faithful, just. It is easy, perhaps, to be a friend, it is not too difficult to be faithful, but how hard to be just to one's friend. DRECHSEL was all these things. Often we disagreed: but we never quarrelled because he was just. He was utterly loyal — loyal to the Council, loyal to his friends. It has been well

said that no man is indispensable. That is true: but there are men who are irreplaceable. There never was but one DRECHSEL and there will never be another.

Gentlemen, I know what are your wishes, and I venture accordingly to state without question put, that the Council desires to convey to Mrs. DRECHSEL an expression of their deep sympathy with her in her irreparable loss and of their own profound regret at the departure of a faithful and deeply beloved friend and counsellor.

As you are aware, her daughter Mrs. ØLLGAARD is here among us. It was difficult for her to come: but her mother particularly wished that DRECHSEL's family should be represented at this celebration which he had so much at heart up to the very hour of his death, and we are all grateful to her that she has had the great courage to be with us and let us testify to her our deep regard for her father's memory. I thank her in your name and will ask her to be our messenger to convey the Council's sympathy and regrets to her mother.

Senator Professor VOLTERRA spoke as follows: —

En m'envoyant une invitation pour prendre part à cette réunion vous avez certainement voulu manifester vos sentiments de sympathie vers la Commission pour l'exploration scientifique de la Méditerranée que j'ai l'honneur de présider. En même temps vous avez voulu montrer l'intérêt que vous prenez aux travaux de techniciens et le désir que vous avez qu'il y ait une entente entre les deux institutions et autant qu'il est possible une collaboration.

C'est donc avec le plus grand plaisir et la plus sincère reconnaissance que j'ai accepté votre aimable invitation et je suis heureux de me trouver parmi vous dans cette occasion solennelle, et de pouvoir assister à vos travaux. Déjà à Venise l'année passée dans l'occasion de notre assemblée nous avons eu l'honneur d'inviter et de recevoir votre éminent Président et nous nous rappelons les paroles si aimables qu'il nous a adressées et tout l'intérêt qu'il a pris à nos réunions.

Vous célébrez le 25ème anniversaire de votre fondation. Un quart de siècle s'est écoulé pendant lequel par vos recherches, par vos travaux, par les découvertes, que vous avez faits dans tous les domaines de l'étude de la mer, votre renommée s'est accrue de jour en jour. Vous avez accompli un œuvre utile et pratique, les industries de la mer s'en sont avantagées, et en même temps vous avez fait avancer presque toutes les sciences: la physique, la chimie, l'histoire naturelle et je ne veux même oublier les mathématiques.

Notre Commission est beaucoup plus jeune que la votre: elle ne compte que dix années de vie. Fondée par le regretté Prince de Monaco qui par ses travaux et ses généreuses initiatives a contribué si effectivement au progrès scientifique elle remplit sa tâche d'explorer la mer Méditerranée. Elle publie ses résultats et grâce au zêle de notre éminent secrétaire M. LE DANOIS elle a dans ses dernières années donné une nouvelle impulsion à ses publications.

Vous êtes la sœur ainée de notre institution. A notre sœur ainée nous exprimons nos félicitations et le vœu qu'elle continue son œuvre avec un succès de jour en jour grandissant.

Professor MAGRINI spoke as follows:—

Nous sommes fort reconnaissants à notre Président pour les aimables expressions qu'il nous a adressées.

Au nom de la Délégation italienne et de son Président, l'amiral THAON DI REVEL qui a bien regretté de n'avoir pu aujourd'hui être parmi nous, j'ai l'honneur de vous communiquer que l'Italie, pays maritime par excellence, est heureuse de participer aux travaux du Conseil pour l'Exploration de la Mer qui a d'aussi nobles traditions. Elle espère contribuer, de cette manière, au progrès de la science océanographique et de l'industrie de la pêche si importante au point de vue de l'économie mondiale. La coincidence de notre participation avec le vingt-cinquième anniversaire de l'Institution du Conseil, nous est particulièrement chère.

Nous vous prions, chers Collègues, de bien vouloir agréer les vœux que nous faisons pour que le Conseil ait toujours à continuer dans ses magnifiques traditions de collaboration internationale.

Prof. KNUDSEN spoke as follows:—

On behalf of the Danish colleagues of Kommandör DRECHSEL I should like to thank the President for the kind words he spoke in commemoration of the late General Secretary. Kommandör DRECHSEL was for many years adviser to the Danish Government in all matters connected with the fisheries, and as such he was present at the first preparatory meeting held in Stockholm in 1899. From that time he was connected with the International Investigation of the Sea and was for many years General Secretary. He always took the keenest interest in oceanic explorations, and credit is due to him for the expeditions carried out under the leadership of Prof. SCHMIDT. Thanks, Mr. President, for your appreciative words about our departed colleague.

Point 3 of the Agenda: Report as to present participation.

The President reported as follows:—

14 countries are now taking part in the work of the Council as full members, viz., Belgium, Great Britain, Denmark, Finland, France, Germany, the Irish Free State, Italy, the Netherlands, Norway, Poland, Portugal, Spain and Sweden. Latvia also participates as a free member, and has for the last three years contributed Kr. 2,000 per annum to the funds of the Council. Esthonia, formerly a free member, has now withdrawn.

All participating countries have now agreed to participation for five years from July 21st, 1926, subject to the necessary financial provision being made by their respective parliaments from year to year.

Point 4 of the Agenda: Administrative Report.

The President referred to the Administrative Report already circulated. No observations were made, except that some minor corrections of some of the reports of the Area Committees would be required. It was agreed that these could be made by the Chairmen, and the Administrative Report was adopted, subject to this understanding.

Point 5 of the Agenda: Reorganisation of the Bureau.

The President moved the Resolution of which he had given notice in accordance with Regulation 7 of the Council in the following terms:—

"that Regulation 4 which reads as follows:—

'The Council is a deliberative body, the executive Authority of which is vested in the Bureau, consisting of a President, three Vice-Presidents and a General Secretary, appointed by the Council from among its members'

be amended by the omission of the words 'and a General Secretary' and the substitution for the word 'three' after the word 'President' of the word 'four'."

In moving the above Resolution, the President stated that the suggestion embodied in it was not a new idea resulting from the death of the late General Secretary. On the contrary, he had often discussed it with Capt. DRECHSEL, and had suggested to him that after the celebration of the 25th Anniversary he should tender his resignation as a Danish Delegate and become simply an officer of the Council. He had gathered the impression that it was Capt. DRECHSEL's intention to act on this suggestion, and he had hoped that some such resolution as he was now moving would be moved by Captain DRECHSEL himself.

He felt that the position of a General Secretary who as such was a servant and the representative of the whole Council was sometimes apt to be embarrassing when he had also to act as a Delegate and therefore the representative of his own country. In short, he thought that the General Secretary ought to be simply an official of the Council, without any other responsibility.

If this resolution were adopted, the effect would be that there would be a vacancy for a fourth Vice-President, and that the General Secretary would no longer be a Member of the Bureau, and that his appointment would not be a matter of annual election; he would be a permanent official of the Council. He (the President) was anxious that before taking a decision on the motion the Council should fully understand what was involved by it, and, in order that there might be no possibility of misunderstanding, he asked Dr. LE DANOIS to summarise in French the observations which he had just made.

Dr. LE DANOIS thereupon gave a resumé of the President's remarks in French. After he had done so, the President added that M. TISSIER had reminded him of a point which he wished to have made clear, namely, that, as a matter

of course, it was intended that the Secretary of the Council should be present at all meetings of the Bureau to advise them and take part in their discussions, and that, although he would not have a vote as a member of the Bureau, he would exercise, through the permanent character of his functions, a considerable degree of influence over their decisions.

There being no observations on the President's proposal, he stated that he assumed that the reconstitution of the Bureau was agreed by the Council, and he therefore called upon M. Tissier to deal with Point 6 of the Agenda.

Point 6 of the Agenda: Proposal for filling the Vacancy in the Bureau.

M. Théodore Tissier thereupon proposed the election of Dr. Heinrici as a Vice-President of the Council in the following terms:—

Messieurs et chers Collègues.

Je désire témoigner du sentiment personnel dont je suis animé et qui répond à celui de mon Gouvernement et de mes compatriotes français en proposant l'élection du 1er délégué allemand, M. le Dr. Heinrici, comme vice-président du Conseil International.

Déjà l'an dernier, sur le terrain du Conseil International, qui est comme une petite Société des Nations, dont l'activité est consacrée aux sciences de la mer, j'ai tendu la main à M. Heinrici; cette année je fais quelque-chose de plus. Je lui apporte ma voix et je prie mes excellents collègues de lui accorder la leur.

Ainsi, M. Heinrici, s'établira entre nos deux pays une co-opération qui, de la part des Français, sera, je vous en donne l'assurance, entièrement sincère et sans aucune arrière pensée; cette co-opération réalisera le vœu unanime des membres du Conseil International. Dans la paix qui, j'en ai le ferme espoir, durera perpétuellement, elle contribuera efficacement, pour les choses de la mer, aux progrès de la science auquels sont liés les progrès de l'humanité.

The proposal was carried by acclamation, and Dr. Heinrici expressed his thanks in the following terms:—

Ich danke Herrn Präsidenten Tissier für die freundlichen Worte, mit denen er meine Wahl zum Vice-Präsidenten vorgeschlagen hat. Seine Worte finden einen lebhaften Wiederhall bei meinen deutschen Kollegen und mir. Deutschland ist in die Internationale Meeresforschung wieder eingetreten in dem Wunsche, durch seine Mitarbeit deren Ziele zu fördern. Meine deutschen Kollegen und ich wollen an der Lösung der Aufgaben der Internationalen Meeresforschung mitwirken durch eifrige sachliche Betätigung und durch Pflege guter Beziehungen zum Bureau wie zu den Delegierten und Sachverständigen der anderen Länder.

In diesem Sinne nehme ich das mir angetragene ehrenvolle Amt an und sage Ihnen allen herzlichen Dank dafür, dass Sie mir Ihre Stimme gegeben haben. Ich bin sehr erfreut, in dem Bureau mitwirken zu können und stelle meine Arbeitskraft dazu gerne zur Verfügung.

Permettez moi, Monsieur le Président, de résumer les mots que je viens de dire: Je remercie sincèrement Monsieur le Président TISSIER de la proposition qu'il a faite et de la manière dont il l'a faite. Je remercie Messieurs les Délégués de l'honneur qu'ils ont accordé à mon pays et à moi-même en me donnant leur voix.

Point 7 of the Agenda: Final Approval of the Accounts, 1925—1926.

The President submitted the accounts for 1925—26 for final approval, stating that they had, as shown, been audited and found correct.

The accounts were approved.

Point 10 of the Agenda: Discussion of publication of a special Volume in celebration of the 25th Anniversary of the Council.

The President proposed that this question be relegated to the Editorial Committee for consideration, and suggested that for this purpose additional members should be added to the Committee. It was agreed that Professor ODÓN DE BUEN and Professor MAGRINI should be added to the Editorial Committee for the purpose of a discussion of the question of a 25th Anniversary Volume.

Point 11 of the Agenda: Arrangements for Committee Meetings.

The programme of Committee Meetings which had been circulated was adopted by the Council.

The President begged the Delegates and Experts to be punctual in their attendance at Committee Meetings, and strict in their observance of the programme. He pointed out that the Committees were so numerous and the time at the disposal of the Council so short that it was only by strict punctuality that the Council could hope to get through its work.

The Meeting then adjourned.

Second Sitting: Monday, May 30th, at 3,30 p. m.

The President, Mr. MAURICE, in the chair.
Present: The members of the Council.

The following memorandum, submitted by the Bureau, was considered.

Organisation of the office in Copenhagen.

Memorandum for consideration of the Council without Experts.

The Council, at its opening meeting on May 27th, adopted the proposal made by the President with the concurrence of the Bureau that the Bureau should in future consist of the President and 4 Vice-Presidents instead of the President, 3 Vice-Presidents and the General Secretary.

The President explained that it was the intention of the Bureau to suggest

further that the Secretary in charge of the office at Copenhagen should not in future be chosen from among the members of the Council, but that he should be an official of the Council, paid and employed by them in that capacity.

The Bureau are unanimous in thinking that, as a matter of convenience and economy, and, it may be added, to maintain, though with modification, the state of things which has become traditional, the endeavour should be made to secure for this post a Secretary of Danish Nationality.

The Bureau has given much thought to the question of the future organisation of the office at Copenhagen with particular regard to three questions: — I. What Staff is necessary. II. How the appointment of a Secretary should be made, and III. what alteration of the function of the Secretary may be involved. The Bureau have arrived at the following conclusions, which they hope that the Council will endorse.

I. The Staff required.

It is difficult at present to have a clear idea on this subject. The personality, the experience and the capacity of the late General Secretary were such that the Council and the Bureau were seldom called upon to consider the question and allowed themselves with confidence, which has been fully justified, to be guided by the General Secretary. Before arriving at any definite conclusion on this subject the Bureau desire to have further experience of the work involved.

In particular the Bureau are in doubt whether the direction of the office might not be undertaken by an officer of the Council who is employed also for some technical function, just as, at present, the office is directed by Captain Schoening who is responsible for the technical work in connection with the Statistical Bulletin.

II. The appointment of a Secretary.

Assuming that it is agreed that the Secretary shall be an official of the Council and not a member of it, the appointment of a Secretary would naturally become a function of the Bureau who appoint all the members of the staff at Copenhagen.

The Bureau propose, in any case, that no appointment should be made before the end of October next; that until that date, Captain Schoening should be requested to continue in charge, and that a suitable honorarium should be paid to him specially for this interim service.

In the meantime, if the Council concurs, the Bureau will carefully study the situation, and will make such appointments as their experience indicates.

III. The function of the Secretary.

It follows, as a matter of course, from the alteration of the position of the Secretary that his responsibilities, though still important, will be less comprehensive. To mark this difference the Bureau propose that the Secretary in charge of the office at Copenhagen should be known by the title of Administrative Secretary (Secrétaire Administratif) and no longer as General Secretary.

The whole of the staff employed at the office, whether clerical or technical, should be directly responsible to the Administrative Secretary and subject to his discipline.

The Administrative Secretary should be charged with responsibility for all payments in accordance with the Budget and should be authorised to sign cheques on behalf of the Council and to meet all unforeseen expenses on his own authority, though he would be expected to refer to the President in any case of an unforeseen expense of considerable magnitude or one as to the propriety of which he was in doubt.

The Administrative Secretary should also conduct all the ordinary correspondence of the Bureau, consulting the President as occasion arises.

In the matter, however, of questions involving the intervention of the Danish Ministry of Foreign Affairs, the Bureau propose that the President should, if possible, make arrangements whereby he may as a matter of convenience be in direct communication with that Ministry. The Bureau have requested the President to discuss this question with the Director of this Ministry, Count Reventlow, at Copenhagen.

The reserve fund of the Council is considerable and the responsibility for its safe keeping is one which the Bureau feel to be more than can fairly be laid upon the Administrative Secretary. They accordingly suggest that, for the present at any rate, the Danish Delegates should be requested by the Council to undertake the control of the funds, particularly with a view to securing that both the invested and the liquid reserve are lodged in a bank as to whose stability there is no reason for apprehension.

The memorandum gave rise to a long discussion, from which it appeared that some members of the Council had imperfectly understood the intention of the President's resolution with regard to the reorganisation of the Bureau, which had been adopted at the first meeting of the Council. In particular, it appeared that some of the Delegates had not realised that it was the intention of the Bureau to propose that in future the Secretary of the Council, whether he were called General Secretary or Administrative Secretary, or by any other name, should not be selected from among the Delegates, but should be a permanent official of the Council.

Professor KNUDSEN inquired whether it was the intention of the Bureau that Experts as well as Delegates should be barred from taking the post of Secretary.

The President replied that that certainly was the intention of the Bureau, who thought that the Secretary should be an official of the Council, responsible solely to the Council.

M. THÉODORE TISSIER soutient ce point de vue et fait remarquer que des difficultés pourraient se produire si un délégué se trouvait en présence de devoirs contradictoires. Un expert ou un délégué doit être le serviteur du Gouvernement qui l'a mandaté, et il est toujours possible que son devoir vis à vis de son Gouvernement se trouve ou semble en conflit avec son devoir vis à vis du Conseil, et avec les meilleures intentions du monde, il peut mal défendre les intentions du Conseil. On pourrait evidemment dire la même chose à propos du Président, mais le Président ne peut agir sans l'approbation du Bureau, tandis que le Secrétaire qui est l'interprète permanent du Conseil, à son siège, se trouve

continuellement dans la situation d'avoir à prendre des initiatives et d'avoir à parler suivant ce qu'il considère comme l'intérêt du Conseil.

Professor HJORT pointed out that in making the Secretary a permanent official of the Council the Council would be following the precedent established by the League of Nations.

Professor ODÓN DE BUEN inquired whether it was the intention that the Administrative Secretary should be an officer of the Council or of the Bureau.

The President pointed out that an officer of the Council and officer of the Bureau were one and the same thing because the Bureau was in effect merely the executive or administrative committee of the Council and exercised only the authority which the Council gave it.

M. THÉODORE TISSIER fait remarquer que le Secrétaire Administratif doit être responsable devant le Bureau comme le Bureau l'est devant le Conseil, les fonctions du Bureau sont, en effet, d'interpréter et d'exécuter les volontés du Conseil.

Professor WITTING pointed out that the arrangement proposed clearly was sufficient for the administrative part of the Council's work but found it difficult to decide whether the scientific side in this way did find due regard.

The President pointed out that the scientific work would not be affected, because it was in effect directed by the Consultative Committee, which was a scientific body and might almost be described as the scientific bureau of the Council.

Various members were disposed to take exception to the suggestion that the Bureau rather than the Council should appoint the Administrative Secretary.

Mr. JONES pointed out that the Council was far too large a body to undertake the selection of an official. If the appointment were taken out of the hands of the Bureau, then the Council would be compelled to appoint a committee for the purpose.

The President agreed with the view expressed by Mr. JONES, and said that the appointment of a committee would be the obvious course to adopt if the Council had not already an Administrative Committee in the form of the Bureau, elected by itself, and obviously the most suitable body for the purpose.

M. VERBRUGGHE supported the proposal of the Bureau as a whole; what was sought was an officer who was to be responsible for administrative matters in the office. It was preferable to have one who was the servant of the Council as a whole, without other responsibilities. Whether he should be appointed by the Council, by the Bureau or by a committee was a matter of comparatively small importance, but as the Bureau was charged with administrative responsibility it seemed to be their obvious duty to deal with this matter.

Dr. LE DANOIS ajoute que dans aucune institution, les fonctionnaires ne sont nommés par le corps tout entier de l'institution.

Professor RAFAEL DE BUEN felt that the fact that the Secretary was to be a permanent official made it extremely necessary to secure that he should be satisfactory to the Council as a whole.

The President inquired whether Prof. DE BUEN wished to suggest that the appointment of an Administrative Secretary by the Bureau should be subject to confirmation by the Council.

Professor DE BUEN was understood to favour this idea, but M. VAN RIEL pointed out that the Council would be in no better position to judge of the suitability of a Secretary, under this arrangement than they would be if they took the matter out of the hands of the Bureau altogether. He urged that the Council, who had themselves elected the Bureau, should have sufficient confidence in them, and should leave the matter in their hands.

This view was supported by Professor HJORT, who pointed out again that the work of the Administrative Secretary would be administrative, and that the obvious body to appoint him was the Administrative Committee of the Council, namely, the Bureau.

After some further discussion, the proposals in the memorandum submitted by the Bureau were adopted by the Council *'nemine contradicente'*.

Third Sitting: Tuesday, May 31st, at 2,30 p. m.

The President, Mr. MAURICE, in the chair.
Present: The members and experts (vide list pp. 4—7).

The President opened the meeting and stated that in accordance with the decision of the first sitting of the Council the following telegram had been sent to his Majesty the King of Denmark:—

"A sa Majesté le Roi de Danemark, Sorgenfri.
Les membres du Conseil International pour l'Exploration de la Mer, réunis à Stockholm, demandent la permission de témoigner à cette première séance pléniaire à Votre Majesté leurs sentiments respectueux.

MAURICE, Président, Grand Hotel."

in reply to which the following telegram had been received from the king:—

"Mes remerciements sincères.

CHRISTIAN R."

A telegram had been received from the Swedish Fish Trades Union reading as follows (in translation):—

"Swedish Fish Trades Union begs to express to the International Council their gratitude for the magnificent and fruitful work performed by the Council during 25 years — not least for the benefit of the Swedish fishing industry. The Union present their best wishes for further progress and results.

For the Union

Janne A. Claesson. Josef Johansson."

Prof. PETTERSSON announced that the Swedish Commission had invited several honoured guests, i. e. some of those personalities who took part in the meeting in Stockholm in 1899. Only Prof. VOLTERRA and Prof. BJERKNES had been able to accept the invitation, but also Prof. NANSEN, Dr. ALLEN, Sir WILLIAM HARDY, Councillor LEHMKUHL, Dr. C. G. JOHS. PETERSEN, Prof. HEINCKE, Dr. J. RICHARD, Prof. HELLAND HANSEN, Prof. A. PENCK, Prof. VAN EVERDINGEN, Dr. REDEKE, Prof. GRAHAM KERR and Dr. H. R. MILL were invited, and he regretted that they had not been able to come.

Point 9 of the Agenda: Proposal by the President concerning a pension for Mrs. Drechsel.

The President stated that the Bureau wished to lay proposals before the Council which, by ordinary standards, might be criticised as being too generous. They were, however, satisfied that they were justified in making these proposals to the Council. They had learned beyond doubt that, through circumstances which it was not necessary to discuss, Mrs. DRECHSEL was left with practically no means other than certain small pensions she receives as the widow of a Naval Officer and of a former Captain of the Harbour of Copenhagen. In considering the question of a pension, the Bureau had taken into account not only the above circumstances but the long and valued services which Capt. DRECHSEL had given to the Council, both as a Delegate for 25 years, and as General Secretary for over 15 years. They trusted that the Council would regard the question in the same light.

The proposal of the Bureau was the following:— On their own authority they had given instructions that the late General Secretary's full salary should be paid to Mrs. DRECHSEL up to the end of October. This date was selected for the practical reason that she was occupying an expensive flat from which she could not possibly move before the month of October at the earliest.

The Bureau asked the Council to endorse this arrangement, and further to pay her, after the end of October, an annual pension of 6,500 Kroner.

The Bureau had also learned that Mrs. DRECHSEL would be called upon in the current year to meet liabilities of a special kind, which might amount to some 4,500 Kroner; they were anxious that she should, at the date when her pension from the Council fell to 6,500 Kr., be free from all embarrassment, and they accordingly asked the Council's authority to discharge outstanding liabilities up to a maximum of 4,500 Kr. in the current year.

Dr. LE DANOIS having, at the President's request, summarised these proposals in French, Professor KNUDSEN and Professor SCHMIDT jointly seconded the proposal, which was adopted by the Council without discussion.

(NB. The President informed Mrs. DRECHSEL of the decision of the Council, on his return to Copenhagen after the Council Meeting. Mrs. DRECHSEL asked him to express her warm gratitude to the Council, and at the same time said that she preferred not to accept the offer to discharge current liabilities. She expressed the opinion that the Council had, apart from this, treated her very generously, and she felt that as she was receiving the late Secretary's salary up to the end of October, she ought to be able to meet the current liabilities unaided.

The President said he would inform the Council accordingly, but that he would regard the Council's authority as holding good in case she might find need of some assistance to enable her to start free from all embarrassments after the end of October. In these circumstances no provision has been made in estimates for this payment.)

Point 10 of the Agenda: Discussion of publication of a special Volume in celebration of the 25th Anniversary of the Council.

The President referred to a resolution by the Editorial Committee, as follows:—

"The Editorial Committee having considered the report of their Sub-Committee, appointed for the purpose, recommends that a special volume commemorative of the 25th anniversary of the foundation of the Council be prepared and published in the format of the Rapports.

We estimate that the Volume will contain at least 300 pages, that the cost will be in the neighbourhood of 7.500 Kr. and that it will not in any case exceed 9000 Kr.

The volume should be prefaced by a short introduction which might be prepared by the President and Professor PETTERSSON, and should also contain a number of memorial notices and portraits of distinguished men no longer living who have worked in or in connection with the Council.

It will be necessary to appoint an Editor or an Editorial Sub-Committee for the purpose of preparing and issuing the volume and it is highly important that the volume should appear before the end of 1927."

On behalf of the Bureau he suggested that the arrangements should be left in charge of the enlarged Editorial Committee. The Bureau would, however, suggest certain limitations, the one as mentioned in the circular letter from the President of February 8th that no individual contribution should exceed 5000 words and no contribution of a participating country 20,000 words. Furthermore that the cost of the publication should not exceed 10,000 Kr. He did not think it likely that the cost would reach that sum. The cost of the special volume would be chargeable to the reserve fund.

Dr. LE DANOIS demande au Bureau d'étudier la question du prix des publications. Il pense que les prix payés par le Bureau à Copenhague sont trop élevés, et que les publications pourraient être éditées ailleurs à meilleur compte,

à Paris, par exemple. Il insiste pour qu'un appel à la concurrence soit fait dans différents pays.

The President pointed out that, as regards the estimate for the proposed Anniversary Volume, the sum suggested was an outside maximum. He thought it would be embarrassing to have the publications of the Council printed in various parts of Europe, and that the preferable course would be, in the first instance, to see whether any reduction of charges could be obtained in Denmark.

Dr. LE DANOIS déclare qu'il désire vivement que le Bureau s'occupe de la question.

The proposal of the Editorial Committee regarding the treatment of the Anniversary Volume was adopted, subject to the limitations proposed by the Bureau.

Point 12 of the Agenda: Consideration of the Reports and Programmes of the Committees.

The President submitted the programmes and reports of the various Committees one by one, leaving to the end the reports calling for special observation. The Chairmen of certain Committees drew attention to the fact that the reports circulated needed revision in certain particulars which did not affect the substance of the programmes. It was agreed that alterations of an editorial character required to make the reports uniform or to rectify omissions might be made by the staff of the Bureau, in consultation, so far as was necessary, with the Chairmen of the Committee.

Subject to the above, the reports of the Committees of the North-Eastern Area, the North-Western Area, the three North Sea Committees, the Transition Area and the Atlantic Slope Committees were adopted.

The programme of the Limnological Committee contained a proposal that Professor, Geheimrat Henking be asked to prepare a report on Salmon and Sea Trout. The President understood from the report of the Chairman of the Consultative Committee and a discussion with Professor HENKING that the idea was to survey the work done on Salmon and Sea Trout in various countries with a view to considering later what further work, if any, the Council should undertake. No charge would be involved on this year's Budget, but next year some remuneration for Prof. HENKING would be proposed. The programme was adopted.

Plankton Committee. The President stated that there were two proposals involving expenditure. 1) That 3000 Kr. be provided to meet the expense of a study of the comparative catching power of various standard nets. 2) That Dr. V. I. PETTERSSON be authorised to incur expenditure up to Kr. 500 for the further improvement of his new Plankton Apparatus in the light of recent tests. The Bureau recommended that provision be made in the Budget accordingly. The report was adopted.

Statistical Committee. The President said that he need only draw attention to the proposal (No. 4) of the Consultative Committee that an inquiry should be addressed to the participating Governments as to the extent to which they could supply information regarding the relation between catch and fishing power. A communication on this subject would be sent to the Delegates from the Bureau. The report of the Statistical Committee was adopted.

Moray Firth Committee. The President said that the Committee itself and the Consultative Committee had proposed that the Report with appendices should be printed and transmitted to the Governments concerned, but that its general publication should be subject to the consent of Great Britain. This was agreed.

Prof. HJORT referred to the recommendation of the Moray Firth Committee that an honorarium should be given to Mr. CROWE who had acted as Secretary to the Moray Firth Committee. He was personally anxious that the Council should express their thanks to Mr. CROWE in this manner and he suggested an honorarium of Kr. 400. This was agreed.

The President said he thought that thanks were due also to Dr. BOWMAN who was responsible for the greater part of the scientific reports of the Committee.

Whaling Committee. The President stated that it was proposed that the Procès-Verbal of the meeting of the Committee in Paris should be edited either in typed or in printed form and revised, and then be communicated to the Governments concerned. This was adopted.

Hydrographical Committee. The President stated that the Report from this Committee was not yet available, but that the proposals of the Committee which required confirmation by the Council had been considered by the Consultative Committee and were supported by this Committee in its recommendations Nos. 5 and 6. With regard to the Sub-Committee for consideration of the question of calculation of salinities the President asked Prof. KNUDSEN who were suggested as members.

Prof. KNUDSEN answered that the persons proposed were Prof. SCHOTT, Mr. VAN RIEL, Mr. LUMBY and himself with the assistance of Dr. V. I. PETTERSSON. He added that the Consultative Committee had dealt with and approved the whole report of the Committee, but only the questions involving expenditure were specifically referred to in the Consultative Committee's recommendations.

The proposals were adopted after it had been agreed that, instead of fixing September as the time for the meeting of the Sub-Committee, it should be left to Prof. KNUDSEN to call the Committee at a convenient time in the autumn.

As to the organisation of the Hydrographical Service in Copenhagen it was agreed that present arrangements should be continued until the next meeting of the Council.

Professor KNUDSEN then read the report of the Hydrographical Committee which was adopted.

Dr. ANDERSSON informed the Council that the Baltic Committee's Report had been considered by the Consultative Committee, but owing to lack of time it had not been possible to duplicate it. The Report was read and adopted.

The President said that at a joint meeting the Transition Area Committee and the Baltic Committee had proposed that a meeting should be held in order to discuss certain special problems. The proposal was dealt with in recommendation 5 of the Consultative Committee. The Bureau recommended this proposal for adoption. The Council adopted the recommendation of the Consultative Committee.

Prof. PETTERSSON raised the question of the experiments with saving gears and proposed that these experiments should go on on the same conditions as last year. He said the Swedish Commission considered this question a very important one; they had sent out several types of gear on loan and were most anxious to have them satisfactorily tested.

The President asked if this question had been dealt with in the Consultative Committee, and

Prof. HJORT answered that it had not been dealt with in the Consultative, but in several other Committees.

Mr. BORLEY stated that it was dealt with in the Southern North Sea Committee and it was intended that the experiments should be continued.

Prof. MIELCK regretted that bad weather had interfered with the German experiments, but said that he would go on with the experiments this summer and next year. Professor PETTERSSON asked to be kept informed of the results.

Enlargement of the Consultative Committee.

With reference to the recommendations of the Consultative Committee not already discussed in connection with the reports of the other Committees, the President drew particular attention to recommendation No. 7. Professor HJORT, as Chairman of the Consultative Committee, was anxious to be relieved of some of his other work in order to have more time at his disposal for keeping touch with the Chairmen of Committees. For this purpose, the Bureau wished to propose to the Council that Mr. SUND should be appointed Vice-Chairman of the North-Eastern Area Committee, with a subvention of 3,000 Kroner.

The President thought it convenient in this connection to add two further proposals of the Bureau, namely:—

1) that Professor MIELCK should be an honorary Vice-Chairman of the combined North Sea Committee; and

2) that all Chairmen and Vice-Chairmen of Scientific Committees should be ordinary members of the Consultative Committee.

There would thus be no distinction drawn between ordinary members and supernumerary members, and although it would follow that the Consultative Committee would be a considerably larger body than was previously contemplated, and therefore a more expensive body to summon, he hoped that the Council would adopt these suggestions. He pointed out that if recommendation 7 of the Consultative Committee were put into effect and the Chairman of it, both by correspondence and perhaps also by occasional visits, maintained close touch with the other members, the occasions for special meetings of the Consultative Committee apart from Council Meetings would be comparatively rare.

Dr. LE DANOIS, ayant, à la demande du Président, résumé les remarques précédentes en français, et parlant en son nom, saisit l'occasion de demander à tous les membres du Comité consultatif et au Conseil dans son ensemble de marquer par leurs remerciements leur gratitude au Docteur HJORT pour la façon dont il a su présider les débats du Comité consultatif, en rendant ainsi fructueuses les discussions de ce Comité.

These observations of Dr. LE DANOIS were warmly endorsed by the Council, and the resolutions of the Consultative Committee as a whole were adopted.

An Oceanographical Bibliography.

The President laid before the Council the following proposal with regard to Bibliography:—

"On propose:

1. la constitution d'une Commission spéciale pour étudier la question de la Bibliographie rationelle de l'Océanographie d'accord avec les autres organisations internationales qui s'occupent d'Océanographie.
2. la commission devra présenter ses conclusions à la prochaine réunion plenière du Conseil.

(Signé) MAGRINI, RUSSELL, KNUDSEN.

The proposal was seconded by Prof. PETTERSSON and adopted by the Council. Prof. MAGRINI, Dr. RUSSELL and Prof. KNUDSEN were nominated members of this Committee.

Effects of Oil in Sea-Water.

Prof. ODÓN DE BUEN having proposed that the Council should take up the study of the effects of oil in sea-water, the President said that he felt difficulty in supporting the proposal, if it involved the formation of another Committee. He reminded the Council of the Conference recently held in Washington at which agreement had been reached as to the needs of a convention dealing with

oil pollution. The question was one affecting other interests besides fisheries and there appeared to be reason to doubt whether, as a matter of fact, fisheries were seriously affected by such oil as found its way into the sea. He wished, therefore, to suggest to the Council that Prof. Odón de Buen should be invited to prepare a report embodying all the information procurable as to the ill effects of oil on fish and fisheries. If Prof. de Buen agreed, the President hoped that all Delegates would provide him with the fullest information they could procure. He further suggested that the Council should arrange subsequently to meet Prof. de Buen's expenses.

Prof. Odón de Buen having expressed his willingness to undertake the report, the President's proposal was adopted.

Point 8 of the Agenda: Statement of Accounts.

The President did not think there was anything in the accounts which called for special attention, except the fact that, as agreed, they have been made up to March 31st to fit in with the decision of the Council to hold its meetings in the spring. The statement of accounts was agreed.

Point 13 of the Agenda: Estimates for the financial year 1927—28.

The President stated that there had not been time to prepare a corrected Estimate with full details. The provisional Estimates which had been distributed would require revision, but the resolutions taken by the Council did not involve an excess of expenditure over revenue as it was agreed that certain of the items, in particular the cost of the Anniversary Volume, should be charged to the reserve fund.

The revenue of the Council would be increased by Kr. 25,000 owing to the adherence of Italy at a rate of contribution of 20,000 Kroner and the decision of Poland to pay her full contribution of Kr. 10,000.

Prof. Siedlecki said that the Polish Government had last year joined the Council on condition that they should pay a reduced contribution corresponding to that paid by some other countries in financial difficulties. It was a great pleasure to him to be able to announce that Poland's economic condition had so greatly improved that she was now able to offer to pay the full contribution.

The President said that all the members of the Council were grateful to Poland for using this first opportunity of increasing her contribution.

With regard to expenditure the President asked the Council to allow the Bureau to circulate the Estimates later. He wished, however, to mention that the Bureau had decided to recommend the following augmentations of the salaries of the staff: Miss Rehder an increase of 1000 Kr. (from 3500 to 4500) in accordance with a proposal made by the late General Secretary and also a slight increase for Miss Hansted of 250 Kr. making her salary 4000 Kr. a year. These proposals and the proposal to present the Budget later were agreed.

The German "Meteor" Expedition.

The President proposed that a telegram of congratulation should be sent to the German "Meteor" expedition which had produced such important results.

The terms of the proposed telegram were as follows:—

> Le Conseil International pour l'Exploration de la Mer envoie ses meilleurs félicitations à l'Expédition du Météor à son retour d'un travail fructueux.

The proposal was warmly approved.

The Council's Farewell to its Distinguished Visitors.

Before the members separated the President wished to address a few words to two distinguished guests, M. le Senateur et Professeur VOLTERRA and Professor BJERKNES and spoke as follows:—

M. VOLTERRA, nous ne pourrions pas vous laissez partir sans vous dire avec quel vif plaisir nous vous avons reçu parmi nous. Nous vous savons gré du discours si intéressant que nous avons entendu hier de vos lèvres et surtout, et le plus chaleureusement possible, nous vous remercions de l'honneur de votre assistance à notre réunion jubilaire.

Mr. BJERKNES, it has been a very great pleasure to us to receive you among us, thank you for coming and good luck to you in the work you have in hand.

M. VOLTERRA expressed his thanks in the following words:—

Je n'oserais pas, étant le plus incompétant de tous, de donner mon avis sur ce que j'ai vu et entendu ici pendant vos séances, ni même d'exprimer mon impression. Mais puisque j'ai pris la parole, le premier jour de votre réunion, pour vous remercier de votre invitation si aimable, permettez moi d'ajouter un seul mot pour vous dire que j'apprécie aujourd'hui l'avantage que j'ai eu en venant parmi vous, beaucoup plus que je ne pouvais le faire au moment de mon arrivée. Ce que j'ai appris en voyant votre organisation, vos méthodes scientifiques et administratives, la manière de dépêcher dans un temps très court une masse si grande d'affaires, la distribution du travail dans les Commissions, la manière méthodique d'envisager les questions qui se présentent et de les résoudre, ne peut manquer de frapper et de soulever la plus sincère admiration. J'espère de pouvoir utiliser tout ce que j'ai vu et entendu. Aux félicitations que j'ai eu l'honneur de vous adresser pour les résultats que vous avez atteints dans 25 années de travail assidu permettez moi que j'ajoute les félicitations les plus chaleureuses pour la manière, je dirai si économique, par laquelle vous travaillez rapidement et par le moins d'effort possible. Vous obtenez, grâce à l'admirable direction de vos travaux, des résultats si importants.

En venant en Suède il y a à peu près 20 ans j'ai été instruit par M. PETTERSSON et par M. BJERKNES des commencements de votre institution. Elle n'était pas si vaste et complète qu'elle l'est aujourd'hui. Que de propos avez vous accompli depuis cette époque! Vous avez su gagner la confiance de toute l'Europe qui admire

votre succès. Permettez moi de vous dire que c'est à cette époque, en apprenant l'existence du Conseil pour l'Exploration de la Mer que j'ai eu l'idée de constituer dans mon pays une institution analogue. C'est de là que le Comité talassographique Italien est sorti en s'appuyant d'abord sur la Société Italienne pour l'avancement des sciences.

J'ai dit le premier jour comment il serait désirable qu'il y ait une entente entre votre Conseil et la Commission pour l'exploration scientifique de la Méditerranée. Les méthodes de recherches sont la plupart du temps analogues pour les deux institutions. Les buts à poursuivre sont tout à fait les mêmes. Mais je suis heureux de constater qu'il y a déjà une première liaison. Elle s'est établi à travers le détroit de Gibraltar entre notre Commission et votre Comité du Plateau Continental Atlantique qui a une domaine si vaste à explorer depuis l'Irlande jusqu'à la côte de l'Afrique et qui s'occupe de l'hydrographie générale du secteur et des migrations du thon rouge, du germon, de la sardine, du merlu.

J'espère que les liaisons que nous souhaitons se feront de jour en jour plus étroites. Votre éminent Président, celui qui dirige vos discussions et vos travaux d'une manière si admirable et avec un tact si exquis m'en a donné l'espoir, je puis dire l'assurance même, depuis qu'il a connu notre institution au Congrès à Venise.

J'ai appelé notre institution la sœur cadette, la votre la sœur aînée. Je ne doute pas que les deux sœurs marcheront dans l'avenir la main dans la main.

Mr. Bjerknes said that he was very astonished to receive thanks for his attendance. The Council had been at work for 25 years which was not a very long time, and we were still at the beginning of the work. There were great problems to be solved, but the Council had shown the way to approach this solution. He felt that no great advance had been made yet on the physical side of the work, and this he considered to be the most fundamental part, in as much as it forms the natural basis even of biological oceanography. He thanked the Council for their kind reception.

Point 14 of the Agenda: Nomination of the members of the Bureau, the Finance Committee, the Editorial Committee and the Editors etc.

On the proposal of the President the following members were elected as members of the Finance Committee:—

The President,
Prof. R. de Buen,
Prof. Johs. Schmidt,
Prof. G. Magrini and
M. Verbrugghe.

The present members of the Editorial Committee were re-elected with exception of Prof. MIELCK, whose place was taken by Prof. EHRENBAUM. The two members added to the Committee for the purpose of considering the special Jubilee Volume, Prof. ODÓN DE BUEN and Prof. MAGRINI, were elected as permanent members. The vacancy caused by the death of Capt. DREHSEL was filled by the election of Prof. SIEDLECKI.

The Chairmen of all the Area Committees having been re-elected by their respective Committees, their re-election was confirmed by the Council. Dr. RUSSELL was re-elected Editor of the Journal.

Various names were added to certain Area and other Committees. Complete lists of the members of Committees will be found on pp. 40—45.

Dr. TESCH proposed the re-election of the Bureau as a whole. The proposal was seconded by Prof. SIEDLECKI and passed by acclamation.

The President briefly thanked the Council for the renewal of their confidence in the Bureau.

Point 15 of the Agenda: Time and place for next Council Meeting.

The President stated that this question was subject to consideration by the Bureau later on. He took it as agreed that it should be some time in the spring, and thought it should be in Copenhagen.

The President moved a vote of thanks to Governor VON SYDOW. The Council, he said, was deeply grateful to the Swedish Commission for all the arrangements made for their convenience and their comfort.

They had reason to be especially and personally grateful to Governor VON SYDOW and Madame VON SYDOW for the many charming hospitalities which had been showered upon them and upon the ladies who accompanied them. In the name of the Council he asked the Governor to accept their thanks to himself and his wife. He would also ask him to convey the expression of the Council's gratitude to the Swedish Commission, over which he presided with such distinction, for their help and their hospitality, to the Municipality of Stockholm for their hospitable entertainment in their magnificent Town Hall, to the Swedish Fish Trades Union for their telegram of greeting, and lastly, as in some sort embracing them all, to the Swedish Royal Government, who had first honoured the Council with their invitation to them to meet in Stockholm, and had then chosen so efficient and distinguished an intermediary as Governor VON SYDOW to secure that the meeting should, in all its aspects, be an unqualified success.

The vote of thanks was passed by acclamation.

Governor VON SYDOW (speaking in French) having thanked the President for his words and the Council for their reception of them, said that the Commission were deeply touched by this warm appreciation of their efforts, and rejoiced that they had been successful. He concluded by expressing the hope that before long

a meeting of the Council would be held in Gothenburg. He concluded — "Ainsi, je ne veux pas dire 'adieu' mais 'au revoir'."

In conclusion the President proposed a vote of thanks to the ladies of the staff who had had hard work, the more so because they were working away from their office and in strange surroundings. Also they had been so kindly entertained that they had been the objects of a continual fight between pleasure and duty. He was glad to say that duty had won every time. The vote was passed by acclamation.

The meeting then terminated.

ESTIMATES

of

the International Council for the Study of the Sea for the financial year 1927—28.

Receipts:—

Head	No.	Item	Kroner	Kroner
I	1	**Balance** on the 31st March 1927 [1]		195,294,25
II	2	**Annual Contributions of the Governments** [2]		177,000,00
III	3	**Interests on bank deposit** ..... estimated		4,000,00
IV	4	**Sale of publications** ..... estimated		1,000,00
		Total Receipts estimated		377,294,25

[1]) **Balance:—**
Kr. 49,069,02 Danish Treasury Bills.
„ 146,225,23 Cash and deposited in the Handelsbank.
Kr. 195,294,25

[2]) The annual contributions have been estimated at the value of one year's income from this source, vide table of contributions on page 39. As it is not convenient to alter the financial year during which contributions may be paid, July 22nd to July 21st, and as it is desired to alter the accounting year of the Council to April 1st—March 31st, the assumption is made for the purpose of this account that the Council will, on the average, have at its disposal in any twelve months the equivalent of one year's revenue from this source. It will be observed that the balance in hand at the end of any accounting year (31st March) may vary according to the dates upon which the different participating countries pay their contributions.

Expenditures:—

Head	No.	Item	Kroner	Kroner
I		**Incidental expenses:—**		
	1	President	6,000,00	
	2	Administrative Secretary	10,000,00	
	3	Chairman of the Editorial Committee	2,000,00	
	4	Hydrographical Consultant	3,000,00	
	5	Editor for Statistics	2,000,00	
	6	Editor of the Journal	3,000,00	
			26,000,00	26,000,00
II		**Assistance:—**		
	7	1st Assistant Secretary	6,000,00	
	8	2nd Assistant Secretary	4,500,00	
	9	Hydrographical Department	13,000,00	
	10	Statistical Department	10,000,00	
			33,500,00	33,500,00
III		**Expenses of the office in Copenhagen:—**		
	11	Rent, service, heating, stationery, books, binding of books etc.	15,600,00	15,600,00
IV	12	**Travelling expenses**	18,000,00	18,000,00
V	13	**Chairmen of Committees**	26,250,00	26,250,00
VI	14	**Special Resolutions** of the Council	36,046,69	36,046,69
VII	15	**Printing and distribution**	72,611,82	72,611,82
		Total expenditures		228,008,51

Remarks to Estimate (1927—28).

Receipts. Head IV has been increased to 1,000 Kr. because the results of the sales of publications for two years will be received in one year.

Expenditures. Item 2. This sum has been inserted to provide for contingencies pending a final arrangement as to the appointment and salary of the Administrative Secretary.

Item 11. 600 Kr. have been added for books, binding of books etc. for the Hydrographical Department.

Item 12 includes provision for special meetings of the Moray Firth Committee, the Whaling Committee, the Transition Area and Baltic Committee, etc.

Item 14 includes Kr. 6,588,36 liabilities incurred under the budget September 1926 but not paid by the date of the closing of the last account, in March 1927. It also includes Kr. 9,100 for the Tidal Institute, Liverpool, in accordance with the resolution of September 1926, Kr. 11,458,33 pension to Mrs. Drechsel, Kr. 4,500 for Mrs. Drechsel's current liabilities, if required, Kr. 3,000 for the study of the comparative catching powers of the various standard nets, and certain minor sums voted at the last meeting of the Council.

Item 15. Kr. 22,611,82 have been added to this item to meet liabilities incurred under the last budget but not paid by 31st March 1927. Kr. 10,000 have been added to it for the expenses of the 25th Anniversary Volume.

Annual Contributions of the Governments:—

Belgium	5,000,00
Great Britain	20,000,00
Denmark	10,000,00
Finland	5,000,00
France	20,000,00
Germany	20,000,00
Ireland	10,000,00
Italy	20,000,00
Netherlands	10,000,00
Norway	10,000,00
Poland	10,000,00
Portugal	5,000,00
Spain	20,000,00
Sweden	10,000,00
Latvia	2,000,00
Kr....	177,000,00

Note.

It will be observed that the total budget of 228,008,51 is 46,008,51 in excess of annual revenue, but the cost of Mrs. Drechsel's pension &c. and the cost of the Jubilee volume are chargeable to the Reserve Fund, and 38,300,18 Kr. are attributable to previous budgets, especially the budget framed in September 1926, the accounts under which were cut short at 31st March, 1927: there is thus an abnormal expenditure included in the Budget of 64,258,51 Kr., the normal expenditure being 163,750 Kr.

Special Reserve for Pensions.

Cash in hand at 31st March 1927	Kr. 3,967,31
Interests from Treasury Bills falling due in 1927—28	- 2,580,00
	Kr. 6,547,31

List of Members of Committees.

Consultative Committee.

Professor Johan Hjort, chairman,
Mr. Oscar Sund,
Professor Johs. Schmidt,
Dr. Ed. le Danois,
Professor Rafael de Buen,
Mr. David T. Jones,
Prof. W. Mielck,
Dr. A. Bowman,
Mr. J. O. Borley,
Dr. A. C. Johansen,
Dr. K. A. Andersson,
Professor Martin Knudsen,
Professor C. H. Ostenfeld,
Professor D'Arcy W. Thompson,
Professor H. Henking,
Dr. E. S. Russell.

North Eastern Area Committee.

Norway:	Professor Johan Hjort, chairman,
	Mr. Oscar Sund, vice-chairman,
	Mr. S. K. Asserson,
Denmark:	Professor Johs. Schmidt,
England:	Dr. E. S. Russell,
France:	Commandant Charcot,
	failing him Dr. Ed. le Danois,
Germany:	Mr. H. Lübbert,
Scotland:	Dr. R. S. Clark,
Sweden:	Dr. K. A. Andersson,
	Dr. G. Ekman.

North Western Area Committee.

Denmark:	Professor Johs. Schmidt, chairman,
England:	Dr. E. S. Russell,
France:	Dr. Ed. le Danois,
Germany:	Professor E. Ehrenbaum,
	Mr. H. Lübbert,
Norway:	Mr. Oscar Sund,
Scotland:	Dr. A. Bowman.

Atlantic Slope Committee.

France:	Dr. Ed. le Danois, chairman,
	Professor L. Joubin,
	Professor L. Roule,
Spain:	Professor Rafael de Buen, vice-chairman,
	Professor José Giral,
England:	Dr. E. J. Allen,
	Dr. E. S. Russell,
Germany:	Professor G. Schott,
Irish Free State:	Mr. G. P. Farran,
Italy:	Professor G. Magrini,
Portugal:	Dr. A. Ramalho.

Combined North Sea Committee.

Mr. David T. Jones, chairman,
Professor W. Mielck, vice-chairman.

Northern North Sea Committee.

Scotland:	Dr. A. Bowman, chairman,
Denmark:	Professor Johs. Schmidt,
England:	Mr. J. O. Borley,
France:	M. le Gall,
Germany:	Professor E. Ehrenbaum,
Holland:	Dr. J. J. Tesch,
Norway:	Mr. Oscar Sund,
Sweden:	Professor O. Pettersson,
	Dr. A. R. Molander.

Southern North Sea Committee.

England:	Mr. J. O. Borley, chairman,
Belgium:	Professor G. Gilson,
Denmark:	Dr. A. C. Johansen,
France:	Dr. Ed. le Danois,
Germany:	Professor W. Mielck,
Holland:	Mr. P. M. van Riel,
	failing him Professor E. van Everdingen,
	Dr. J. J. Tesch,
Norway:	Mr. Paul Bjerkan,
Scotland:	Dr. A. Bowman,
Sweden:	Dr. K. A. Andersson.

Transition Area Committee.

Denmark:	Dr. A. C. JOHANSEN, chairman,
	Professor MARTIN KNUDSEN,
Germany:	Dr. S. STRODTMANN,
	Dr. E. FISCHER,
Norway:	Mr. PAUL BJERKAN,
Sweden:	Professor O. PETTERSSON,
	Dr. K. A. ANDERSSON.

Baltic Area Committee.

Sweden:	Dr. K. A. ANDERSSON, chairman,
	Dr. H. PETTERSSON,
Denmark:	Dr. A. C. JOHANSEN,
	Professor MARTIN KNUDSEN,
Finland:	Professor R. WITTING,
	Professor T. H. JÄRVI,
Germany:	Professor H. HENKING,
	Dr. E. FISCHER,
Latvia:	Mr. V. MIEZIS,
Poland:	Professor M. SIEDLECKI,
	Professor J. SMOLENSKI.

Hydrographical Committee.

Denmark:	Professor MARTIN KNUDSEN, chairman,
Belgium:	Professor G. GILSON,
England:	Mr. J. O. BORLEY,
Finland:	Professor R. WITTING,
France:	Dr. ED. LE DANOIS,
Germany:	Professor G. SCHOTT,
Holland:	Mr. P. M. VAN RIEL,
	Professor E. VAN EVERDINGEN,
Irish Free State:	Mr. G. P. FARRAN,
Italy:	Professor G. MAGRINI,
Latvia:	Mr. V. MIEZIS,
Norway:	Mr. OSCAR SUND,
Poland:	Professor M. SIEDLECKI,
Portugal:	Dr. A. RAMALHO,
Scotland:	Professor D'ARCY W. THOMPSON,
Spain:	M. LÉON HERRERO,
	Professor JOSÉ GIRAL,
	failing them Professor RAFAEL DE BUEN,
Sweden:	Professor O. PETTERSSON.

Sub-Committee for Calculation of Salinity Normals.

Professor Martin Knudsen,
Mr. J. R. Lumby,
Mr. P. M. van Riel,
Professor G. Schott,
Assisted by Dr. V. I. Pettersson.

Plankton Committee.

Denmark:	Professor C. H. Ostenfeld, chairman,
Belgium:	Professor G. Gilson,
England:	Mr. R. E. Savage,
Germany:	Professor K. Brandt,
Holland:	Dr. J. J. Tesch,
Irish Free State:	Mr. G. P. Farran,
Latvia:	Mr. V. Miezis,
Norway:	Mr. Paul Bjerkan,
	Professor H. Gran,
Poland:	Dr. A. Litynski,
Scotland:	Dr. R. S. Clark,
Spain:	Dr. Juan Cuesta Urcelay,
Sweden:	Dr. K. A. Andersson.

Statistical Committee.

Scotland:	Professor D'Arcy W. Thompson, chairman,
	Mr. David T. Jones,
Belgium:	Professor G. Gilson,
England:	Dr. E. S. Russell,
	Mr. T. Edser,
Finland:	Professor T. H. Järvi,
France:	M. G. Lecourbe,
Germany:	Professor H. Henking,
Holland:	Dr. J. J. Tesch,
Irish Free State:	Mr. C. Green,
Latvia:	Mr. V. Miezis,
Norway:	Mr. S. K. Asserson,
Poland:	Mr. J. Borowik,
Spain:	Captain Sebastian Noval,
	Dr. Fernando de Buen,
Sweden:	Dr. K. A. Andersson.

Limnological Committee.

Germany:	Professor H. Henking, chairman,
Denmark:	Dr. A. C. Johansen,

England:	Dr. E. S. Russell,
Finland:	Professor T. H. Järvi,
France:	Professor L. Roule,
Irish Free State:	Mr. R. Southern,
Latvia:	Mr. V. Miezis,
Poland:	Professor M. Siedlecki,
	Dr. F. E. Lubecki,
Spain:	Dr. Fernando de Buen,
Sweden:	Dr. K. A. Andersson.

Editorial Committee.

Professor O. Pettersson, chairman,
Professor D'Arcy W. Thompson,
Professor G. Gilson,
Professor L. Joubin,
failing him Dr. Ed. le Danois,
Professor Martin Knudsen,
Professor E. Ehrenbaum,
Professor Odón de Buen,
Professor G. Magrini,
Professor M. Siedlecki,
Dr. E. S. Russell.

Finance Committee.

The President,
Professor R. de Buen,
Professor Johs. Schmidt,
Professor G. Magrini,
M. Léon Verbrugghe.

Special Committees.

Moray Firth Committee.

Professor Johan Hjort, chairman,
Dr. A. Bowman,
Professor E. Ehrenbaum,
Professor G. Gilson,
Dr. E. S. Russell,
Professor Johs. Schmidt,
Dr. J. J. Tesch,
M. Léon Verbrugghe.

Whaling Committee.

Professor JOHAN HJORT, chairman,
Mr. J. O. BORLEY,
Dr. FERNANDO DE BUEN,
Dr. ED. LE DANOIS,
Mr. DAVID T. JONES,
Deputy Dr. A. BOWMAN,
Professor JOHS. SCHMIDT,
Dr. A. RAMALHO,
Mr. H. LÜBBERT.

Committee for Oceanographical Bibliography.

Professor G. MAGRINI,
Dr. E. S. RUSSELL,
Professor MARTIN KNUDSEN.

Recommendations of the Consultative Commitee.

Chairman: Prof. JOHAN HJORT.
The Committee met on 23rd, 25th, 30th and 31st May 1927.

1) Reports of Chairmen of Area Committees.

The Consultative Committee considered that it was desirable that the programmes of work in progress should in their main lines be continued in the ensuing year; and they suggested that the Chairmen in dealing with the question of programmes should advise their Committees to confine discussion to suggestions for modifying or extending the various area programmes rather than reopening the whole field of discussion with a view to the possibility of undertaking work on new lines.

The Consultative Committee resolved to ask the Committees, when making programmes and resolutions for their work involving expenses, not to suggest any definite sum, but to leave it to their chairman to discuss the necessary amount with the Consultative Committee whose Chairman would bring it before the Bureau.

The Consultative Committee considered it undesirable in the protocols of the meetings to state the names of the members or guests present and of those taking part in a discussion unless the matter under discussion was dealt with; and they asked the Committees to proceed in their protocols in accordance with this proposition.

2) Report of the Moray Firth Committee.

The Consultative Committee resolved to submit the Report of the Moray Firth Committee to the International Council with the following recommendation: The Report of the Moray Firth Committee was laid before the Consultative Committee which decided to submit the Report to the International Council recommending the findings of the Committee as summed up in the last two paragraphs on p. XVII of the Moray Firth Committee's Report.

3) Composition of the Consultative Committee.

The Consultative Committee recommended, in consideration of the fact that the combined North Sea Committee, now being fully representative of all

Recommandations du Comité Consultatif.

Président: Le Prof. Johan Hjort.
Le Comité se réunit les 23, 25, 30 et 31 Mai 1927.

1) Rapports des Présidents des Comités des Secteurs.

Le Comité consultatif considère comme désirable que les programmes de travail en cours soient continués, dans leurs grandes lignes, l'année suivante. Il suggère que les Présidents en traitant la question des programmes devraient recommander à leurs Comités de limiter les discussions à des propositions tendant à modifier ou à étendre les divers programmes des secteurs, plutôt que de rouvrir tout le champs de la discussion concernant la possibilité d'entreprendre quelque travail d'un genre nouveau.

Le Comité consultatif décide de demander aux Comités, lorsqu'ils élaborent pour leur travail des programmes ou des résolutions comportant des dépenses, de ne proposer aucune somme définie, mais de charger leur Président de discuter la somme nécessaire, au Comité consultatif, dont le Président porterait la question devant le Bureau.

Le Comité consultatif considère comme indésirable que l'on indique, dans les protocoles des réunions, les noms de tous les membres ou hôtes présents, ni de ceux qui prennent part à une discussion, à moins que le sujet discuté ne soit traité. Il demande que les Comités rédigent leurs protocoles conformément à cette proposition.

2) Rapport du Comité du Moray Firth.

Le Comité consultatif décide de soumettre le Rapport du Comité du Moray Firth au Conseil International avec la recommandation suivante: Le Rapport du Comité du Moray Firth a été soumis au Comité consultatif qui a décidé de transmettre ce rapport au Conseil International en recommandant les conclusions de ce Comité telles qu'elles sont résumées dans les deux derniers paragraphes p. XVII du Rapport du Comité du Moray Firth.

3) Composition du Comité consultatif.

Le Comité consultatif, considérant que le Comité combiné de la Mer du Nord, devenu pleinement représentatif de toutes les nations riveraines de la Mer du Nord,

the countries bordering on the North Sea, had become sufficiently important to justify the appointment of a Vice-Chairman, that Prof. MIELCK be appointed to that post and to a seat in the Consultative Committee.

4) Report of the Statistical Committee.

The Consultative Committee, having considered the Report of the Statistical Committee, recommended that enquiries be made of the participating countries as to the extent to which they could, either now or in the near future, supply such data on the relation between catch and fishing power as are contemplated in Mr. EDSER's motion; and that the replies be considered and the whole subject further dealt with by the Statistical Committee at its next meeting.

5) Incidental Meetings.

The Consultative Committee approved the proposal of the Transition Area and Baltic Area Committees concerning the proposed meeting in the autumn of these Committees on the understanding that — so far as the Council is concerned — the purpose of the meeting is to prepare a scientific report to be laid before the Council on the fisheries referred to by the two Committees.

The Consultative Committee recommended that a special meeting of the Hydrographical Sub-Committee be held at Copenhagen in autumn 1927 in order to work out proposals for the calculation of salinity normals.

6) Hydrographical Service.

The Consultative Committee, after having heard the statements of the Hydrographical Committee, recommended that the Sub-Committee appointed for consideration of salinity normals should be asked to report to the Hydrographical Committee at its next meeting as to the organisation of the Hydrographical Service.

7) Discussion of Problems of general Interest.

The Consultative Committee recommended that the Chairman of the Committee should, through correspondence with the members, select some definite problems of general interest for full discussion at the next meeting of the Committee and that members who are to introduce such subjects should prepare short abstracts for circulation at as early a date as possible.

est aujourd'hui assez important pour justifier la nomination d'un Vice-Président, recommande la nomination du Prof. Mielck pour ce poste et pour un siège dans le Comité consultatif.

4) Rapport du Comité statistique.

Le Comité consultatif, prenant en considération le rapport du Comité statistique, recommande que des informations soient prises dans les divers Pays participants au sujet de la mesure dans laquelle ils pourraient fournir, à présent ou prochainement, les données sur la relation entre la capture et le pouvoir capturant qui sont envisagées dans la motion de Mr. Edser, et que les réponses soient examinées et tout le sujet traité par le Comité statistique dans sa prochaine réunion.

5) Réunions accidentelles.

Le Comité consultatif approuve la proposition des Comités du Secteur Baltique et du Secteur de Transition au sujet de la réunion de ces Comités projetée pour l'automne, sous la réserve que, — pour autant que le Conseil y est intéressé, — le but de cette réunion soit de préparer un rapport scientifique à présenter au Conseil, au sujet des pêcheries mentionnées par les deux Comités.

Le Comité consultatif recommande qu'une réunion spéciale du Sous-comité hydrographique se tienne à Copenhague en automne 1927, en vue d'élaborer des propositions pour le calcul des salinités normales.

6) Service hydrographique.

Le Comité consultatif, ayant pris connaissance des déclarations du Comité hydrographique, recommande qu'il soit demandé au Sous-comité nommé pour l'examen des questions des normes de salinité, de faire rapport au Comité hydrographique, à sa prochaine réunion, au sujet de l'organisation du Service hydrographique.

7) Discussion de problèmes d'un intérêt général.

Le Comité consultatif recommande que son Président choisisse, par correspondance avec les membres, quelques problèmes bien définis, d'intérêt général à mettre en discussion plénière à la prochaine réunion du Comité, et que les membres qui désirent introduire certains sujets en préparent de courts résumés, pour circulation à une date aussi proche que possible.

Programmes and Reports of Area Committees.

North Eastern Area Committee.

Chairman: Prof. JOHAN HJORT.
The Committee met at 11,30 a. m. on 26th May 1927.

The Chairman opened the meeting and welcomed the German representative, Prof. MIELCK.

Members of the Committee reported on the work carried out since the meeting at Copenhagen in September 1926.

a) Mr. SUND reported on the Arcto-Norwegian stock of cod. An article regarding this question will appear in the next number of the Journal.

Mr. ASSERSON, in connection with the communications made, expressed his thanks to Dr. RUSSELL for the excellent facilities provided by the English Fisheries Office through Mr. BORLEY for a Norwegian observer onboard an English trawler fishing in the White Sea. Dr. RUSSELL hoped that arrangements also could be made for the next year.

b) Prof. SCHMIDT made a short communication with regard to Russian researches on a special variety of the cod: *"Gadus callarias maris-albi"*. He would be very grateful to anyone who would try to get samples of this variety for comparison.

c) Mr. PAUL BJERKAN gave a short account of the work done in Norway under the direction of Mr. E. LEA on the stock of herring, and showed with help of diagrams that new year-classes appeared during the later part of the Norwegian spring herring fishery this year.

d) Prof. SCHOTT referred to German hydrographical investigations to be made by the "Poseidon" in the Barents Sea. A more detailed communication on these investigations would be made in the Hydrographical Committee.

On the proposal of the Chairman and in accordance with the suggestion of the Consultative Committee it was resolved to continue the September programme until the next meeting of the Committee in spring 1928.

Prof. HJORT was re-elected Chairman for the ensuing year.

Programmes et Rapports des Comités des Secteurs.

Comité du Secteur Nord-Est.

Président: le Prof. Johan Hjort.
Le Comité se réunit à 10h30 a. m. le 26 Mai 1927.

Le Président ouvre la réunion et souhaite la bienvenue au délégué allemand le Prof. Mielck.

Des membres du Comité font rapport sur le travail accompli depuis la réunion de Copenhague en Septembre 1926.

a) Mr. Sund fait rapport sur le stock arcto-norvégien du cabillaud. Un article sur cette question paraîtra dans le prochain numéro du Journal.

Mr. Asserson, à propos des communications qui viennent d'être faites exprime ses remerciements au Dr. Russell pour les excellentes facilités fournies par le Bureau des Pêcheries Anglaises, à l'intervention de Mr. Borley, à un observateur Norvégien à bord d'un chalutier anglais pêchant dans la Mer Blanche. — Le Dr. Russell espère que des dispositions pourront encore être prises pour l'année prochaine.

b) Le Prof. Schmidt fait une courte communication au sujet d'une variété du cabillaud: le *"Gadus callarias maris albi"*. Il serait reconnaissant à qui lui procurerait des exemplaires de cette variété, pour la comparaison.

c) Mr. Paul Bjerkan donne un court aperçu sur le travail exécuté en Norvège sur le hareng, sous la direction de Mr. E. Lea, et montre, à l'aide de diagrammes, que de nouvelles classes annuelles ont apparu pendant la dernière partie de la pêche norvégienne du hareng de printemps, cette année.

d) Le Prof. Schott traite des investigations hydrographiques allemandes qui doivent être faites par le "Poseidon" dans la Mer de Barents. Une communication plus détaillée sur ces investigations sera faite au Comité hydrographique.

Sur la proposition du Président, et d'accord avec une suggestion du Comité consultatif, il est décidé de continuer le programme de Septembre, jusqu'à la prochaine réunion du Comité, au printemps de 1928.

Le Prof. Hjort est réélu Président pour l'année suivante.

North Western Area Committee.

Chairman: Prof. Dr. Johs. Schmidt.
The Committee met at 3,30 p. m. on 26th May 1927.

The Chairman extended a hearty welcome to the German representative on this Committee, Prof. Ehrenbaum.

Short accounts of the work made since the last meeting in September 1926 were given by several members of the Committee. Prof. Schmidt mentioned a report by Mr. Å. V. Tåning on the Iceland plaice, and Dr. Bowman referred to the report by Mr. Harold Thompson on the haddock (for both see additional Report for October—December 1926 pp. 111—113).

The additional Administrative Report for 1926 including the period October—December 1926 was received and approved by the Committee (see pp. 111—113).

It was decided to continue the programme adopted in September 1926 (see Rapports & Procès Verbaux, Vol. XLI, pp. 52—53, 1927) with the additions and modifications stated below until the next meeting in 1928:

Additional Programme for 1927.

Germany. Germany intends to take part in the work of the North Western Area Committee by sending a scientific member of the "Fischerei-biol. Abteilung, Hamburg" and a fish measurer on board of a commercial trawler to the Iceland grounds in order to make special observations on the food of the cod and on any other points connected with the life history of this and other species.

Norway. Norway would consider whether it would be possible to arrange for an expert to accompany the Norwegian fishery expedition in 1927 to the waters of West Greenland and thereby to secure material for the investigation of the life histories of the halibut and the cod.

Scotland. Scotland would be prepared to arrange for taking cod measurements of cod landed from the area in Aberdeen market.

Prof. Schmidt was re-elected as Chairman to the Committee.

Atlantic Slope Committee.

Chairman: Dr. Ed. le Danois.
Vice-Chairman: Prof. Rafael de Buen.
The Committee met at 4.0 p. m. on 26th May 1927.

The Chairman welcomed Prof. Schott as a Member of the Committee.

Additional programme.

(The numbers correspond to the paragraphs of the programme of work in progress).

1) The combined periodical cruises will be continued according to the same programme. The French Government will, however, be asked to extend the quarterly

Comité du Secteur Nord-Ouest.

Président: le Prof. Dr. Johs. Schmidt.
Le Comité se réunit à 3h30 p. m. le 26 Mai 1927.

Le Président exprime une cordiale bienvenue au Prof. Ehrenbaum, représentant de l'Allemagne dans ce Comité.

De courts aperçus sur le travail accompli depuis la dernière réunion de Septembre 1926 sont donnés par plusieurs membres du Comité. Le Prof. Schmidt mentionne un rapport de Mr. Á. V. Tåning sur la plie d'Islande, et le Dr. Bowman signale le rapport de Mr. Harold Thompson sur l'églefin (Voir pour l'un et l'autre le Rapport additionnel pour Octobre—Decembre 1926, p. 111—113).

Le rapport administratif additionnel pour 1926, comprenant la période Octobre—Décembre 1926 est reçu et approuvé par le Comité (Voir p. 111—113).

Il est décidé de continuer le programme adopté en Septembre 1926 (Voir les Rapports et Procès Verbaux, Vol. XLI, p. 52—53, 1927), avec les additions et modifications indiquées ci-dessous, jusqu'à la réunion prochaine en 1928:

Programme additionnel pour 1927.

Allemagne. L'Allemagne a l'intention de participer au travail du Comité du Secteur Nord-Ouest en envoyant un membre scientifique de la "Fischerei-biol. Abteilung" de Hambourg et un mesureur de poissons à bord d'un chalutier commercial, sur les champs d'Islande, en vue de faire des observations spéciales sur la nourriture du cabillaud et sur tout autre sujet en rapport avec l'histoire naturelle de ce poisson et d'autres espèces.

Norvège. La Norvège examinera s'il sera possible de prendre des dispositions pour qu'un expert accompagne l'expédition norvégienne de pêche en 1927 dans les eaux du Groenland occidental et pour recueillir ainsi du matériel pour l'étude de la biologie du flétan et du cabillaud.

Ecosse. L'Ecosse est prête à prendre des arrangements pour faire des mensurations de cabillaud débarqué du Secteur du Nord-Ouest au marché d'Aberdeen.

Le Prof. Schmidt est réélu Président du Comité.

Comité du Plateau Continental Atlantique.

Président: le Dr. Ed. le Danois.
Vice-président: le Prof. Rafael de Buen.
Le Comité se réunit à 4h p.m. le 26 Mai 1927.

Le Président souhaite la bienvenue au Prof. Schott, membre du Comité.

Programme additionnel.

(Les numéros correspondent aux paragraphes du programme en cours.)

1) Les croisières périodiques combinées seront continuées d'après le même programme; toutefois il sera demandé au Gouvernement français d'étendre jusqu'au

stations to Long. 9° W. In addition to this, observations will be made on each voyage at one or more stations in deep water, and, if possible, from surface to bottom, outside the Atlantic Slope. Plankton collections will also be made on all cruises, particularly with the vertical net.

2) No observations.
3) No observations.
4) A Spanish Laboratory having been established in the Canary Islands, a new programme of research in that region will be put forward at the next meeting of the Committee.
5) The care of obtaining an accord for the investigations in the Spanish Bight is entrusted to Prof. Rafael de Buen and Dr. Ramalho.
6) No observations.
7) The studies on the hake, red tunny, long-finned tunny and sardine will be particularly developed with regard to time and place of spawning of these fishes, and the differentiation of local races.
8) No observations.
9) No observations.

On the motion of Dr. Ramalho, the Committee re-elected Dr. Ed. le Danois as Chairman, and Prof. Rafael de Buen as Vice-Chairman for the ensuing year.

North Sea Committees.

I. Combined Committe.

Chairman: Mr. David T. Jones.
The Committee met at 12,30 p. m. on 28th May 1927.

The Chairman pointed out that the Combined Committee was set up to provide a link between the Southern and Northern Area Committees so that any proposals of mutual interest could be discussed.

The reports prepared by the Chairmen of these Area Committees on the investigations carried out in the six months ended December 31st 1926, have been circulated among the members and the programmes proposed to be conducted in future have been adopted.

On the whole the members of the Committee might congratulate themselves on the fact that most useful work had been accomplished in the period since the last meeting, and that real co-ordination between the work of the different countries had been secured in the process.

There were one or two points on which the chairman wanted to comment, one of which was the necessity for continuing concentration of effort on essentials such for instance as the vital problem of securing an efficient savings gear. This was be-

9° W. G. les stations trimestrielles. De plus à chaque sortie, une ou plusieurs stations comprendront des observations en eau profonde et si possible de la surface au fond, en dehors du Plateau Continental. Enfin les sorties seront utilisées en vue de faire des pêches planctoniques, particulièrement à l'aide du filet vertical.

2) Sans observations.
3) Sans observations.
4) Par suite de la fondation d'un laboratoire espagnol aux îles Canaries, un nouveau programme de recherches dans cette région sera présenté à la prochaine séance du Comité.
5) Le soin de l'accord pour les études en Baie d'Espagne est confié à MM. Rafael de Buen et Ramalho.
6) Sans observations.
7) Les études sur le merlu, le thon rouge, le germon, la sardine seront particulièrement développées en ce qui concerne les dates et lieux de ponte de ces poissons et la différenciation des races locales.
8) Sans observations.
9) Sans observations.

Sur la proposition du Dr. Ramalho, le Comité réélit le Dr. Ed. le Danois comme Président, et le Professeur Rafael de Buen comme Vice-Président pour l'année prochaine.

Comités de la Mer du Nord.

I. Comité combiné.

Président: Mr. David T. Jones.
Le Comité se réunit à 12h30 p. m. le 28 Mai 1927.

Le Président fait remarquer que le Comité combiné a été constitué pour établir un lien entre les Comités du secteur Sud et du secteur Nord, afin que des propositions d'intérêt commun puissent y être discutées.

Les rapports préparés par les présidents des comités de ces deux secteurs sur les investigations poursuivies pendant les six mois finissant le 31 Décembre 1926 sont distribués aux membres et les programmes proposés pour l'avenir sont adoptés.

D'une façon générale, les membres peuvent se féliciter de l'accomplissement d'un travail très utile pendant la période écoulée depuis la dernière réunion et de l'établissement d'une réelle coordination de travail entre les divers Pays.

Le Président désire présenter quelques commentaires au sujet de certains points. L'un de ces points est la nécessité de la continuation de la concentration des efforts sur des choses essentielles, telles, par exemple, que le problème vital de l'obtention d'un engin réellement épargneur. Ce problème prend une importance

coming of greater importance every day and if solved would greatly simplify the work of administrators.

Then certain features in the life histories of our most important commercial fishes such as herring, haddock, plaice and cod were still obscure and it was of primary importance to our fisheries that these should be given special and undivided attention.

While the principle on which the organisation is now based could not be discussed it was permissible to examine whether their working arrangements could be improved and made more efficient and possibly some of the members would desire to offer suggestions to that end and in the process secure economy of time, a most important factor in the proceedings.

Dr. Bowman intimated that the Northern North Sea Committee had accepted a recommendation that discussion at the Committee should in future be focussed on the main questions of current importance and that these questions should be included in the agenda and circulated prior to the next meeting and a resolution in the following form was unamimously adopted, viz:—

> The recommendation of the Northern North Sea Committee that one or more subjects of current importance should be selected for discussion at the next meeting in the Committee concerned, or if of interest to both Sub-Committees, in the united North Sea Committee was accepted.

The following resolution was also adopted:—

> The resolutions of the two North Sea Area Committees which were of mutual interest were unanimously adopted.

At the conclusion of the meeting Dr. Bjerkan gave a short account of some recent work which he had carried out on the south and west coast of Norway on the sizes of the young sprats particularly those in their first summer's growth and with reference to their distribution in the first year according to the different sizes. He thanked those members of the Committee who had already contributed samples from other areas and asked for further collaboration in the work.

On the motion of Prof. Ehrenbaum seconded by Dr. Tesch it was unanimously decided to re-elect Mr. David T. Jones as Chairman for the ensuing year.

II. Northern North Sea Committee.

Chairman: Dr. A. Bowman.

The Committee met at 12,30 p. m. on 28th May 1927.

The Chairman welcomed Professors Ehrenbaum and Mielck of Germany and Mr. van Riel of Holland who were making their first appearance at this Committee.

chaque jour plus grande et sa solution simplifierait grandement le travail des administrateurs.

Certains détails, aussi, de la biologie de nos principaux poissons commerciaux, tels que le hareng, l'églefin, la plie et le cabillaud, sont encore obscurs, et il est d'une importance primordiale pour nos pêcheries qu'il soit apporté à leur étude une attention spéciale et non dispersée.

Aussi, bien que le principe sur lequel est basée l'organisation présente ne puisse être discuté, il est permis d'examiner si ses dispositions de travail peuvent être améliorées et rendues plus efficaces. Il est possible que certains membres désirent présenter des suggestions tendant à ce but et à assurer une économie de temps, facteur très important pour les délibérations.

Le Dr. Bowman signale que le Comité du Nord de la Mer du Nord a accepté une recommandation demandant que la discussion au sein du Comité soit, à l'avenir, concentrée sur les principales questions d'importance courante, et que ces questions soient introduites dans la circulaire des "agenda" avant les reunions. Une résolution est unanimement adoptée, dans les termes suivants:

> La Réunion accepte la recommandation du Comité du Nord de la Mer du Nord demandant qu'un ou plusieurs sujets d'importance courante soient choisis en vue de la discussion dans la réunion suivante de chacun des Comités, ou de celle du Comité combiné de la Mer du Nord, si les deux Sous-comités y sont intéresseés.

La résolution suivante est également adoptée:

> Les résolutions des deux Comités des Secteurs de la Mer du Nord qui sont d'intérêt commun, sont uanimement adoptées.

A la fin de la réunion, le Dr. Bjerkan expose un court aperçu sur le travail récemment exécuté par lui sur les côtes Sud et Ouest de la Norvège, au sujet de la taille des jeunes esprots, particulièrement au cours de leur croissance de premier été, et au point de vue de la distribution des différentes tailles au cours de la première année. Il remercie les membres du Comité qui lui ont déjà procuré des échantillons d'autres secteurs et leur demande encore leur collaboration pour son travail ultérieur.

Sur la motion du Prof. Ehrenbaum, appuyée par le Dr. Tesch, il est décidé, à l'unanimité de réélire Mr. David T. Jones comme Président pour l'année suivante.

II. Comité du Nord de la Mer du Nord.

Président: le Dr. Bowman.

Le Comité se réunit à 12h30 p. m. le 28 Mai 1927.

Le Président souhaite la bienvenue aux Profs. Ehrenbaum et Mielck, d'Allemagne, et à Mr. van Riel, de Hollande, qui paraissent pour la première fois au Comité.

With the short space of time intervening since the last meeting in September 1926 very little work had been accomplished by any of the participating countries. Prof. EHRENBAUM gave a short résumé of the work done by Germany during the last few years. This referred chiefly to the racial work on the herring on which preliminary papers have been published. He emphasised the fact that as there had been no agreement in the methods previously adopted, attempts were being directed first to test the modified methods of JOHANSEN with a view to determining how far the German investigators were able to confirm them. The researches so far as they have gone, have given results which agree largely with those obtained by JOHANSEN. In addition to the technique adopted by JOHANSEN observations were made on the number of rays in the pectoral fins, a point which seems to be of great importance in racial determination. The samples which were examined were partly obtained on the markets as it was sometimes difficult to get the requisite investigation steamer for that purpose or to collect samples onboard commercial fishing vessels. As it is now almost an established fact that the general trend of the herring larvae is towards the south and southeast it is interesting and important to note that the young forms of the I and II groups obtained in the German Bight show the same general characteristics as the Bank herring of the North Sea. So far, we are not able to tell how these forms in the following age-groups return to recruit the mature shoals but they evidently return slowly to the west. From age determinations on herring taken in the neighbourhood of Brucey's Garden and northwards to the Shetlands, the observations have shown that the herring of the southern regions are generally speaking a few years younger than those of the Northern North Sea and that the slight differences in the spawning times are apparently due to age. As in the Norwegian investigations there are specially important years for the development of a particular brood but these occur in the Bank herring at shorter intervals.

Dr. JOHANSEN gave some observations on the Danish investigations during the latter half of the year 1926, on the Jutland Bank and Little Fisher Bank and in the region between these and the Dogger Bank. No herring eggs were found in the stomachs of haddock caught by Danish fishermen in this area. A very few newly hatched larvae were taken by the ring trawl in the autumn months. It was concluded that spawning of herring in this area was only of little importance in the year 1926.

Prof. MIELCK indicated that a report on the larval herring collections from 1902 onwards would be published by him probably before the next Committee Meeting.

It was suggested that the programmes of work should be extended to include the period of time which would elapse between the end of the Calendar year and the next meeting of the Committee.

Par suite de la brièveté du temps écoulé depuis la dernière réunion, en Septembre 1926, très peu de travail a été accompli par les divers Pays participants. Le Prof. Ehrenbaum donne un court résumé du travail exécuté par l'Allemagne pendant les dernières années. Ce résumé traite surtout du travail sur les races du hareng, matière sur laquelle des publications préliminaires ont été faites. Il insiste sur le fait que, par suite de l'absence d'accord préalable au sujet des méthodes, on a dû tenter d'abord de mettre à l'épreuve les méthodes modifiées de Johansen, en vue de déterminer jusqu'à quel point les investigateurs allemands pouvaient les confirmer. Les recherches, au point où elles en sont, ont donné des résultats largement d'accord avec ceux de Johansen. En outre de la technique adoptée par Johansen, des observations ont été faites sur le nombre de rayons des nageoires pectorales, point qui paraît être d'une grande importance pour la détermination des races. Les échantillons examinés ont été en partie obtenus sur les marchés parce qu'il eût été difficile d'obtenir pour cet objet le steamer de recherches ou de recueillir des échantillons à bord des navires de pêche commerciaux. Puisque c'est aujourd'hui presque un fait établi que la marche générale des larves du hareng tend vers le Sud et le Sud-Est, il est intéressant et important de noter que les jeunes formes des groupes I et II obtenues de la Baie allemande montrent les mêmes caractéristiques que le hareng des bancs de la Mer du Nord. Pour les groupes d'âge ultérieurs, il n'a pas été possible, jusqu'ici, de dire comment ces formes retournent pour renforcer les bancs de harengs matures, mais il est évident qu'ils regagnent lentement l'Ouest. Les déterminations d'âge faites sur des harengs capturés dans le voisinage de Brucey's Garden et plus au Nord vers les Shetlands, ont montré que les harengs des régions du Sud sont généralement plus jeunes de quelques années que ceux du Nord, et que les légères différences des époques de frayage sont apparemment dues à l'âge. Comme dans les observations norvégiennes, on a noté des années spécialement importantes pour le développement d'une génération particulière mais ces années se répètent à de plus courts intervalles pour le hareng des bancs.

Le Dr. Johansen présente quelques remarques au sujet des observations danoises pendant la deuxième moitié de l'année 1926, sur le Banc du Jutland et sur le petit Fisher Bank, ainsi que dans la région comprise entre ces bancs et le Dogger Bank. On n'a pas trouvé d'oeufs de harengs dans l'estomac des églefins pris par les pêcheurs danois dans cette aire. Très peu de larves récemment écloses y ont été recueillies à l'aide du filet annulaire pendant les mois d'automne. On en a conclu que le frayage du hareng dans cette aire a été de peu d'importance pendant l'année 1926.

Le Prof. Mielck annonce qu'un rapport sur les collections de larves de hareng depuis 1902 sera publié par lui probablement avant la prochaine réunion du Comité.

On suggère que les programmes de travail soient étendus de manière à comprendre la période qui s'écoulera entre la fin de cette année et la réunion suivante du Comité.

The programme laid down in September 1926 was confirmed till May 1928.

A definite recommendation was put to the joint Committee of the North Sea that discussion should be focussed on some of the main current questions and that these subjects for discussion should be included in the Agenda and circulated at an early date.

The following points were suggested for the Northern North Sea:—

1) Evaluation of the Haddock in the northern North Sea; changes in composition of stock from year to year. Are the present data adequate for this purpose?
2) Races of Herring. Spawning areas. Dispersal of larvae in relation to racial work.

Dr. Bowman was re-elected Chairman for the ensuing year.

III. Southern North Sea Committee.

Chairman: Mr. Borley.

The Committee met at 11,30 a. m. on 28th May 1927.

The Chairman opened the proceedings by referring to the close co-operation which had existed between the German workers and the members of the Committee, and welcomed Prof. Mielck (Germany) and Mr. van Riel (Holland) as new members, and Dr. Delsman as guest.

The Administrative Report was adopted, the Chairman promising at the same time to endeavour to secure the inclusion in the printed issue of summaries of material received after the writing of the present draft.

It was agreed that, to meet the present arrangements as to the period to be reported upon annually and the dates of meeting, programmes should be arranged from May to May.

It was agreed that the work during the next twelve months should be in the main a continuation of that now in progress, the German participation being outlined in the appended scheme of work, but at Dr. Tesch's suggestion it was agreed that additional research should be made on the distribution and race of first and second year herring: it is hoped that some work on this subject will be done both on the English coast and by the English research ship in the open sea. Dr. Bowman expressed the opinion that on the Scottish coast the first step towards the study of the race of these small herring is the discrimination of the races of the adults, a problem more practicable to solve and on which Scottish workers are engaged. Prof. Gilson expressed his intention of continuing, at least for two more years, his study of the destructive effects of littoral fishing on small fish. This continuation was rendered necessary, notwithstanding the long period covered by the investigations now completed, owing to the wholesale adoption of the motor

Le programme tracé en Septembre 1926 est prolongé jusqu'en Mai 1928.

Il sera soumis au Comité combiné de la Mer du Nord une recommandation tendant nettement à ce que la discussion se concentre sur quelques unes des questions courantes et que ces sujets de discussion soient indiqués sur une liste d'agenda mise de bonne heure en circulation.

Les points suivants sont proposés pour le Nord de la Mer du Nord:

1) Evaluation de l'églefin dans le Nord de la Mer du Nord, changements dans la composition du stock, d'année en année. Dispose-t-on actuellement des données nécessaires à cette recherche?
2) Races du hareng. Aires de frayage. Dispersion des larves en relation avec les recherches sur les races.

Le Dr. Bowman est réélu Président pour l'année suivante.

III. Comité du Sud de la Mer du Nord.

Président: Mr. Borley.

Le Comité se réunit à 11h30 a. m. le 28 Mai 1927.

Le Président ouvre la séance en rappelant l'étroite collaboration qui a existé entre les travailleurs allemands et les membres du Comité. Il souhaite la bienvenue au Prof. Mielck (Allemagne) et à Mr. van Riel (Hollande) en qualité de membres ainsi qu'au Dr. Delsmann en qualité d'hôte.

Le rapport administratif est adopté, et en même temps, le Président promet de faire son possible pour assurer l'introduction dans la publication de sommaires des textes qu'il pourra recevoir après la rédaction du présent projet.

On décide que les programmes doivent s'étendre de Mai à Mai, afin de répondre aux arrangements actuels réglant la période sur laquelle doit porter le rapport et les dates de réunion.

On décide que le travail pendant les douze mois prochains devra, dans son ensemble, être la continuation de celui qui est actuellement en cours, la participation de l'Allemagne est esquissée dans le projet de travail annexé mais, sur la proposition du Dr. Tesch, on convient qu'une recherche additionelle sera faite sur la distribution et sur les races du hareng de première et de deuxième année: on espère que du travail sera exécuté à la fois sur la côte anglaise et en pleine mer par le navire de recherche anglais. Le Dr. Bowman exprime l'avis que le premier pas dans l'étude des races de ces jeunes harengs doit être la détermination des races des adultes, problème d'une solution plus praticable et à laquelle s'attachent les travailleurs écossais. Le Prof. Gilson exprime son intention de continuer, au moins pendant deux ans, son étude des effets destructeurs de la pêche littorale sur les jeunes poissons. Cette continuation est rendue nécessaire, malgré la longueur de la période sur laquelle ont porté les investigations antérieures, aujourd'hui achevées, par l'adop-

engine for Belgian coastal fishing boats, and the consequent great increase of catching power.

The English results with the Ridderstad trawl were circulated, and Dr. Bowman drew attention to the fact that the proportion saved in the English experiments was markedly less than in the Swedish, though the same gear was employed. Dr. Tesch informed the Committee that he would be experimenting shortly with a similar net of Dutch invention.

The collection of Plankton samples and temperatures from Dutch herring drifters was referred to, and the Committee was informed that the temperature material had been placed in the hands of Prof. van Everdingen for examination. The work will be continued next summer with ten vessels.

Mr. Borley was re-elected Chairman for the ensuing year.

Investigations undertaken by Germany.

(The numbers refer to the Southern North Sea Committee's Programme of September 1926):

Cod.

7) Experiments with Savings-Trawls.

Herring.

3) Investigations into the distribution of the younger stages in the south eastern North Sea.
5) Race investigations in the south eastern North Sea.
9) Investigations into the distribution of larvae in the south eastern North Sea.

Plaice.

2) The continuation of trawling investigations on the Norderney, Heligoland and Amrum sections with "Augusta" for Plaice measurements, distribution and frequency of the various year groups, collection of Otoliths to furnish information concerning the alteration and fluctuation of the stock in the next years.
3) The continuation of the investigation of 0 and I Group Plaice along the coast (habitat, density, biological conditions).
4) The continuation of the quantitative investigations of the food of Plaice (and its competitors), in connection with the quantitative study of the Bottom-fauna.
5) Investigation of differences of growth rate and their causes.
7) Experiments with Savings-Trawls.

tion générale des moteurs par les bateaux de pêche sur la côte belge, et par la grande augmentation de leur pouvoir capturant qui en résulte.

Les résultats des expériences anglaises avec le chalut Ridderstad sont exposés, et le Dr. Bowman attire l'attention sur le fait que la proportion sauvée est notablement moindre dans les expériences anglaises que dans les suédoises, bien que le même appareil ait été employé. Le Dr. Tesch fait connaître au Comité qu'il compte expérimenter prochainement un filet analogue, d'invention hollandaise.

Le prélèvement d'échantillons de plancton et les prises de température à bord des harenguiers dérivants, hollandais, sont signalés, et il est fait connaître au Comité que les données de température ont été remises, pour être examinées, aux mains du Prof. van Everdingen. Ce travail sera continué par dix navires, l'été prochain.

Mr. Borley est réélu Président pour l'année prochaine.

Investigations entreprises par l'Allemagne.

(Les numéros ont trait au Programme du Sud de la Mer du Nord de Septembre 1926).

Cabillaud.

7) Expériences avec des chaluts épargneurs.

Hareng.

3) Investigations sur la distribution des stades jeunes dans le Sud-Est de la Mer du Nord.
5) Investigations sur les races dans le Sud-Est de la Mer du Nord.
9) Investigations sur la distribution des larves dans le Sud-Est de la Mer du Nord.

Plie.

2) Continuation des recherches de chalutage, avec l'"Augusta", dans les sections de Norderney, de Helgoland et d'Amrum, pour les mensurations, la distribution et la fréquence des divers groupes annuels, la récolte des otolithes, en vue de fournir des informations au sujet des altérations et des fluctuations du stock de la plie au cours des années suivantes.
3) Continuation de l'étude des groupes 0 et I de la plie, le long de la côte, (habitat, densité, conditions biologiques).
4) Continuation des investigations quantitatives sur la nourriture de la plie (et de ses concurrents), en relation avec l'étude quantitative de la faune du fond.
5) Recherches sur les différences dans la rapidité de croissance et sur leurs causes.
7) Expériences avec des chaluts épargneurs.

Other Fish.

Investigation of the seasonal distribution and sizes of the most important other fish on every possible occasion of trawling with "Augusta" in the south eastern North Sea. Collection of material for age determination in *Rhombus maximus*, *Rh. laevis* and *Solea vulgaris*.

Experiments with Savings-Trawls.

Benthos.

Continuation of the Benthos investigations with the Petersen grab (in connection with the investigations into the food of fish) in an area of about 200 square miles off the East Frisian coast, chosen for continued work in several years and several seasons.

Hydrography.

Observations of Salinity and Temperature:—

a) daily in the Light vessels "Borkum Riff", "Norderney", "Minsener Sand", "Weser", "Elbe I", "Elbe IV", "Eider", "Amrum Bank" on high and low water time.
b) Surface observations daily in Heligoland Roads.
c) Fortnightly observations at the surface and at various depths on 3 Stations in the open sea near Heligoland.
d) Occasional observations (surface and depth) in the course of cruises of "Augusta" devoted to the study of fish in the south eastern North Sea.

Transition Area Committee.

Chairman: Dr. A. C. Johansen.
The Committee met at 10,45 a. m. on 28th May 1927.

The Chairman opened the meeting and asked the members of the Committee to report on the work carried out since the meeting at Copenhagen in September 1926.

Dr. Bjerkan gave an account of his investigations on the Edible Crab (*Cancer pagurus*) along the Norwegian coasts. He wished that the investigations should be extended to the west coast of Sweden.

Professor Henking made a communication "On the Impoverishment of the Plaice Fisheries in Kiel Bay". By investigations in a series of years he had found that in Kiel Bay the decrease of females was greater than that of males from the period before the war to the recent years.

Autres poissons.

Recherches sur la distribution saisonnière et sur la taille des autres poissons les plus importants, dans toutes les occasions de chalutage à bord de l'"Augusta" dans le Sud-Est de la Mer du Nord. Récolte de matériel pour les déterminations d'âge des *Rhombus maximus*, *Rh. laevis* et de la *Solea vulgaris*.

Expériences avec des chaluts épargneurs.

Benthos.

Continuation des investigations sur le Benthos avec le Petersen grab (en relation avec les recherches sur la nourriture des poissons) dans une aire d'environ 200 milles carrés au large de la côte frisonne, choisie en vue de la poursuite du travail en diverses saisons et pendant plusieurs années.

Hydrographie.

Observations de salinité et de température.

a) Observations journalières à bord des bateaux-phare "Borkum Riff", "Norderney", "Minsener Sand", "Weser", "Elbe I", "Elbe IV", "Eider", "Amrum Bank", au moment de la haute et de la basse mer.
b) Observations journalières de surface dans les passes de Helgoland.
c) Observations de quinzaine, à la surface et à diverses profondeurs en 3 stations de pleine mer près de Helgoland.
d) Observations occasionnelles (surface et profondeur) au cours des croisières de l'"Augusta" consacrées à l'étude du poisson dans le Sud-Est de la Mer du Nord.

Comité du Secteur de Transition.

Président: le Dr. A. C. Johansen.
Le Comité se réunit à 10h45 a. m. le 28 Mai 1927.

Le Président ouvre la réunion et demande aux membres de faire rapport sur le travail exécuté depuis la réunion de Copenhague en Septembre 1926.

Le Dr. Bjerkan donne un aperçu de ses investigations sur le crabe comestible (*Cancer pagurus*) le long des côtes norvégiennes. Il exprime le désir que ces investigations s'étendent à la côte Ouest de Suède.

Le Prof. Henking fait une communication sur "l'appauvrissement des pêcheries de la plie dans la baie de Kiel". Ses investigations poursuivies pendant une série d'années montrent qu'il y a eu, dans la Baie de Kiel, une décroissance des femelles plus marquée que celle des mâles, depuis la période précédent la guerre jusqu'à ces dernières années.

Mr. Borley suggested that it would be perhaps interesting for Prof. Henking to compare the conditions found in Kiel Bay with those on other grounds.

Dr. Johansen expressed the hope that investigations of this nature might be carried out in larger areas.

Dr. Johansen made communication on the following subject: "Do the annual Fluctuations in the Number of young Plaice in the southern Kattegat and Belt Sea depend on the Amount of Food available for the larval Stages in the Winter Months?"

After some discussion the programme for the preceding year was reaffirmed.

The Committee re-elected Dr. A. C. Johansen as Chairman for the ensuing year.

Baltic Area Committee.

Chairman: Dr. K. A. Andersson.

The Committee met at 3,30 p. m. on 28th May 1927.

The following communications were made to the Committee:—

1) Mr. Miezis gave a report on work done in his country since the last meeting at Copenhagen.
2) Dr. G. Alm: On the Migrations of Salmon in the Baltic.
3) Prof. Siedlecki gave a short report on the organisation of hydrographical work in Poland and of the study of Salmon in his country.

Concerning marking of fish the Committee proposed that the marks should have the letter: L for Latvia, P for Poland, S for Sweden.

After discussion of different problems the programme adopted in the last Council Meeting was reaffirmed.

The Committee unanimously re-elected Dr. K. A. Andersson as Chairman for the ensuing year.

Transition Area and Baltic Area Committee.

The Committees met on May 30th 1927.

The following resolution was adopted:—

The Transition Area and Baltic Area Committees propose that before the next Council Meeting a meeting of the Committees should take place in order to discuss the scientific basis for practical measures to be taken regarding the plaice, the flounder, and the salmon in these areas, and that a report should be drawn up for the consideration of the Council.

Mr. Borley suggère qu'il serait peut-être intéressant pour le Prof. Henking de comparer les conditions rencontrées dans la Baie de Kiel avec celles d'autres fonds.

Le Dr. Johansen exprime l'espoir que des investigations de ce genre seront entreprises sur des aires plus étendues.

Le Dr. Johansen fait une communication sur la question suivante: "les fluctuations annuelles du nombre de jeunes plies dans le Sud du Cattégat et dans la Mer des Belts dépendent-elles de la quantité de nourriture disponible pour les stades larvaires pendant les mois d'hiver?"

Après quelque discussion le programme de l'année précédente est réadopté.

Le Comité réélit le Dr. A. C. Johansen comme Président pour l'année suivante.

Comité du Secteur Baltique.

Président: le Dr. K. A. Andersson.

Le Comité se réunit à 3h30 p. m. le 28 Mai 1927.

Les communications suivantes sont faites au Comité:

1) Mr. Miezis fait un rapport sur le travail exécuté dans son Pays depuis la dernière réunion à Copenhague.
2) Le Dr. G. Alm: Sur les migrations du saumon dans la Baltique.
3) Le Prof. Siedlecki présente un court rapport sur l'organisation du travail hydrographique en Pologne et sur l'étude du saumon dans son Pays.

Concernant le marquage des poissons, le Comité propose que les marques portent les lettres: L pour la Lettonie, P pour la Pologne, S pour la Suède.

Après discussion sur divers problèmes le programme adopté dans la dernière réunion du Conseil est réadopté.

Le Comité, à l'unanimité, réélit le Dr. K. A. Andersson comme Président pour l'année suivante.

Comités du Secteur de Transition et du Secteur Baltique.

Les Comités se réunirent le 30 Mai 1927.

La résolution suivante est adoptée:

Les Comités du Secteur de Transition et du Secteur Baltique proposent qu'une réunion des Comités se tienne avant la prochaine réunion du Conseil, afin de discuter une base scientifique pour la prise de mesures concernant la plie, le flet et le saumon dans ces Secteurs, et qu'un rapport soit élaboré en vue de leur prise en considération par le Conseil.

Programmes and Reports of other Committees.

Hydrographical Committee.

Chairman: Professor Martin Knudsen.
The Committee met on 28th and 30th May 1927.

The Committee passed the following resolutions:—

I) That the Bulletin trimestriel should be continued possibly in a modified form, that it should contain text, tables, charts and diagrams, as occasion arises, and that it should contain material from the Baltic, the North Sea and the Atlantic.

II) That further discussion of the form of the Bulletin be referred to a Sub-Committee consisting of Messrs. Borley, Knudsen, V. I. Pettersson, van Riel and Schott.

III) On the recommendation of the above Sub-Committee, after consideration of the draft resolutions proposed by Mr. Borley (appendix A) and the memorandum submitted by Prof. Schott (appendix B) that no alteration of the Bulletin trimestriel should take place before September 1927 but that the proposal for the calculation of salinity normals of the North Sea should be strongly supported. To further this, preparatory work should be put in hand by a Sub-Committee consisting of Messrs. Knudsen, Lumby (or Borley), van Riel and Schott with assistance of Mr. V. I. Pettersson. This Committee should meet at earliest in September 1927.

IV) That the question raised by Prof. Schott in regard to surface observations from liners should be considered by a Committee, consisting of Messrs. R. de Buen, le Danois, Knudsen, Lumby (or Borley), Magrini, O. Pettersson, V. I. Pettersson, Ramalho, van Riel and Schott.

V) On the recommendation of the last named Committee, that the "Service hydrographique" should circulate charts showing the routes at present making observations of surface temperatures and salinities.

VI) That the annexed proposal (appendix C) by R. de Buen and V. I. Pettersson concerning a possible use of thermographs etc. be referred to the last named Committee.

VII) That a circular should be sent to the members of the different countries asking them to direct attention to the preliminary exposition of oceanographical instruments and methods to be held this year in Prague. It was

Programmes et Rapports des autres Comités.

Comité Hydrographique.

Président: le Prof. Martin Knudsen.
Le Comité se réunit le 28 et le 30 Mai 1927.

Le Comité adopte les résolutions suivantes:

I) Le Bulletin trimestriel devrait être continué, peut-être sous une forme modifiée, il devrait contenir du texte, des cartes et des diagrammes suivant les occasions, et il devrait comprendre du matériel provenant de la Baltique, de la Mer du Nord et de l'Atlantique.

II) Qu'une discussion plus ample de la forme du Bulletin soit référée à un Sous-comité composé de MM. Borley, Knudsen, V. I. Pettersson, van Riel et Schott.

III) Sur la recommandation du Sous-comité ci-dessus nommé après la considération du projet de résolutions proposé par Mr. Borley (appendice A), et le memorandum soumis par le Prof. Schott (appendice B), qu'aucune altération ne devrait être apportée au Bulletin trimestriel avant Septembre 1927, mais que la proposition concernant le calcul de la salinité normale de la Mer du Nord devrait être fortement soutenue. Pour hâter cette étude, un travail préliminaire devrait être confié à un Sous-comité composé de MM. Knudsen, Lumby (ou Borley), van Riel et Schott, avec l'assistance de Mr.V. I. Pettersson. Ce Sous-comité se réunira au plus tôt en Septembre 1927.

IV) Que la question soulevée par le Prof. Schott, au sujet d'observations de surface à bord de vapeurs réguliers, soit considéré par un comité composé de MM. R. de Buen, le Danois, Knudsen, Lumby (ou Borley), Magrini, O. Pettersson, V. I. Pettersson, Ramalho, van Riel et Schott.

V) Sur la recommandation du dernier Comité nommé, que le "Service hydrographique" devrait distribuer des cartes montrant les routes sur lesquelles sont faites des observations de température et de salinité de surface.

VI) Que la proposition, présentée en annexe, (appendice C), par MM. R. de Buen et V. I. Pettersson, au sujet de l'usage possible de thermographes etc., soit référée au dernier Comité nommé.

VII) Qu'une circulaire devrait être envoyée aux membres des divers Pays pour attirer leur attention sur l'exposition préliminaire d'instruments et de méthodes océanographiques qui doit se tenir à Prague cette année. Il serait

desired that as much material as possible, which should be of a standard character, should be contributed to the exhibition.

VIII) That a telegram of welcome should be sent to the "Meteor" on her arrival after her two years expedition in the South Atlantic.

Appendix A.

Draft Resolutions.
Submitted by Mr. Borley.

1) That there is a need to determine throughout the North Sea mean salinities based on the greatest practicable number of years' observations and for the shortest periods the material permits.
2) That the Hydrographic Committee undertake this determination and appoint a small Committee to organise the work.
3) That the terms of reference of this Committee shall provide that they
   a) lay down a standard procedure governing the omission of records from the calculations or their modification before inclusion,
   b) adopt very small areas in their tabulation in the first instance, such as 15′ of Latitude, and 30′ of Longitude,
   c) institute and keep their records in a form permitting of the computation of fresh means from time to time.

Appendix B.

Memorandum from Professor Schott
re Quarterly Hydrographical Bulletin.

1) The task of improving, in technical respects, the Bulletin hydrographique trimestriel (larger format? Isothermes + isohalines or separation? etc.) is important, but not essential.

I) 2) The principal requirement is to obtain good mean values for salinity, based on the observations of a number of years, and covering the shortest possible periods — at any rate, monthly, and perhaps even shorter — for the North Sea.

3) The President of the Hydrographical Committee to be entrusted with the task of ascertaining, with the collaboration of the hydrographer of the Council, the most rapid means of obtaining and calculating the mean S $^{0}/_{00}$ in question, as has been done by the Bureau with the tables for North Sea temperatures in the Bulletin hydrographique of 1922, based on the years 1905—14. At the same time, the Bureau to grant the President of the Hydrographical Committee a sum of until 1000 Kroner, out of the budget for

à désirer que l'on envoie à cette exposition le plus possible de matériel d'un caractère standardisé.

VIII) Qu'un télégramme de bienvenue devrait être adressé au "Meteor", à son arrivée après ses deux ans d'expédition dans l'Atlantique Sud.

Appendice A.

Projet de résolutions.
Présenté par Mr. Borley.

1) Qu'il répond à un besoin que l'on détermine pour toute la Mer du Nord des salinités moyennes basées sur le plus grand nombre possible d'observations annuelles, et cela pour les plus courtes périodes que permette le matériel acquis.
2) Que le Comité hydrographique entreprenne cette détermination et nomme un petit Comité pour organiser le travail.
3) Que les termes de référence de ce Comité prescrivent:
   a) qu'il établisse un procédé standard réglant, pour les calculs, l'omission de certaines données ou leur modification avant leur introduction,
   b) qu'il adopte de très petites aires dans sa tabulation initiale, telles que 15′ de latitude et 30′ de longitude,
   c) qu'il établisse et conserve les données tabulées sous une forme permettant de temps en temps la computation de nouvelles valeurs.

Appendice B.

Memorandum du Professeur Schott
au sujet du Bulletin hydrographique trimestriel.

1) La tâche de l'amélioration, au point de vue technique, du Bulletin hydrographique trimestriel (format plus grand? Isothermes + isohalines ou séparation? etc.) est importante mais pas essentielle.

I) 2) Le besoin principal est l'obtention de bonnes moyennes de salinité, basées sur de longues années et couvrant les périodes les plus possibles — au moins les mois, et peut-être des périodes encore plus courtes, dans la Mer du Nord.

3) Le Président du Comité hydrographique reçoit la mission de rechercher, avec la collaboration de l'hydrographe du Conseil, par quels procédés ces moyennes pour S ‰ peuvent être le plus rapidement obtenues et calculées, ainsi qu'il a été fait par le Bureau pour les tables des températures de la Mer du Nord du Bulletin hydrographique de 1922, basées sur les années 1905—14. En même temps il serait accordé par le Bureau, sur l'exercice 1927—28, au Président du Comité hydrographique, une somme de jusqu'à 1000 couronnes,

1927—28, as a first instalment for the remuneration of an assistant employed on the calculations, and other expenses. Such assistant might also be sought in places other than Copenhagen.

II) 4) The second requirement is to ensure:

a) adequate geographical distribution of the actual observations of t° and S ‰ undertaken in the North Sea and the Atlantic,

b) regular service in procuring these values on fixed routes.

The President of the Hydrographical Committee to procure, by correspondance, from representatives of the countries interested, including those of the Mediterranean, the requisite information as to regular lines of commercial vessels from which the nation concerned could obtain regularly the measurements of t° and water samples required.

He will then deal with the information received and make proposals for apportioning the work on the various routes.

5) Until the first results of the foregoing, especially 3) and 4) are available, that is to say, until the autumn of 1927 at least, the Bulletin hydrographique trimestriel will continue to be published in the form adopted up to now.

It is proposed to call a special Conference, at some place to be selected, at the earliest in the autumn of 1927, in connection with these technical improvements in the form of the Bulletin hydrographique trimestriel. The preliminary results of work under headings 3) and 4) should be available, and it would be advisable until then to use the present form of the Bulletin.

Appendix C.

Memorandum from Messrs. Prof. Rafael de Buen and Dr. V. I. Pettersson re the establishment of a special Editorial Department of the Bulletin trimestriel for the southern part of the North Atlantic and for the Mediterranean.

The following proposal is based on the possibility of obtaining thermometrical diagrams from some few metres below the surface, by means of thermographs installed on transatlantic liners.

1) The International Council, through the medium of the Service hydrographique (the hydrographical service) will make trial of various systems of marine thermograph, and then endeavour to arrange for the use of such on board transatlantic liners, requesting the Companies concerned to instal, at the expense of the Companies, thermographs of suitable type on their ocean liners.

2) The diagrams obtained will provide the principal material for surface temperature charts of the Atlantic in the Bulletin trimestriel.

comme premier quote-part destiné à pourvoir à la rémunération d'un personnel calculateur et à d'autres dépenses. Le personnel calculateur pourrait être, éventuellement, cherché en dehors de Copenhague.

II) 4) Le besoin secondaire est de s'assurer:

a) d'une bonne distribution géographique des observations actuelles de t° et de S‰ dans la Mer du Nord et dans l'Atlantique,

b) d'une obtention régulière de ces valeurs sur des routes fixées.

Le Président du Comité hydrographique reçoit la mission d'obtenir, — par correspondance, — des représentants des Pays intéressés, y compris ceux de la Méditerranée, l'information nécessaire sur les lignes régulières de navires de commerce sur lesquelles la nation en question pourrait obtenir régulièrement des mesures régulières de t° et des prises d'échantillons d'eau.

Il trie ces données et fait des propositions concernant la répartition du travail sur ces routes.

5) Jusqu'à ce que ces progrès, et surtout ceux de 3) et de 4), aient montré leurs premiers résultats, c'est-à-dire au moins jusqu'en automne 1927, le Bulletin hydrographique trimestriel continuera à paraître sous la forme adoptée jusqu'ici.

Il est projeté de réunir une Conférence spéciale, en un lieu à choisir, au plus tôt en automne 1927, au sujet de ces perfectionnements techniques concernant la forme du Bulletin hydrographique trimestriel. Les résultats préliminaires des progrès indiqués en 3) et 4) devraient être à sa disposition, et on est d'avis jusqu'ici d'y employer la forme actuelle de ce Bulletin.

Appendice C.

Memorandum de MM. le Prof. Rafael de Buen et le Dr. V. I. Pettersson au sujet de l'établissement d'un département spécial de la rédaction du Bulletin trimestriel, pour la partie méridionale de l'Atlantique Nord et pour la Méditerranée.

La proposition suivante est fondée sur la possibilité d'obtenir des diagrammes thermométriques de quelques mètres sous la surface, au moyen de thermographes installés à bord des navires routiers transatlantiques.

1) Le Conseil International, par l'intermédiaire du Service hydrographique, ferait l'essai de divers systèmes de thermographes marins, puis il en propagerait l'usage à bord des navires routiers transatlantiques en demandant aux Compagnies de faire installer, à leurs propres frais, des thermographes d'un type acceptable sur leurs navires desservant les lignes transocéaniques.

2) Les diagrammes obtenus fourniraient le matériel principal pour les cartes atlantiques des températures de surface du Bulletin trimestriel.

3) After preliminary studies, and with a view to organising as quickly as possible an adequate supply of information, the Hydrographical Service will instal at Madrid a special editorial department of the Bulletin trimestriel, which will receive the diagrams of temperature and other data as to those parts of the Atlantic situated south of that now included in the charts I and II of the Bulletin trimestriel, and from the Mediterranean, forwarding the same to Copenhagen together with all facts and informations of a hydrographical character which might be of interest for the current quarter.
4) The printing will be done in Copenhagen, two languages, English and Spanish, being employed. The Bulletin trimestriel will be published, as at present, about six weeks after the end of each quarter.

Plankton Committee.

Chairman: Professor Ostenfeld.
The Committee met at 10,0 a. m. on 28th May 1927.

A discussion took place on the comparative catching power of various types of nets and the following resolution was agreed to:—

That Professor Mielck of Heligoland should be asked to make a comparative investigation of the catching power of the Hensen, Nansen and Standard nets, and such other nets of similar mesh as are in use, and that a grant should be made to meet his expenses in the investigations.

It was assumed that the participating countries would facilitate the investigation by lending nets of the types that they use.

Professor Gran gave a summary of the investigations of Mikroplankton carried out by himself and his assistants from 1916 to the present time on the coast of Norway, referring especially to the limiting factors in the development of Plankton.

Dr. V. I. Pettersson gave an account of the new Plankton pump constructed by him with the aid of a grant from the Council, and pointed out some improvements which appeared to be necessary after a trial of the instrument under working conditions made by the courtesy of the Norwegian Fishery Authorities.

It was agreed that a sum should be granted to Dr. V. I. Pettersson for making some improvements in his new Plankton Apparatus, which experiments have shown to be desirable.

Professor Ostenfeld's proposal with reference to the appointment of a specialist to study the development of certain Plankton Crustaceans was discussed and the following resolution was agreed to:—

3) Après les études préliminaires, et en vue d'organiser le plus rapidement possible un aussi grand nombre de données, le Service hydrographique installerait à Madrid un département spécial de la Rédaction du Bulletin trimestriel, chargé de recevoir les diagrammes des températures et d'autres données des aires méridionales de l'Atlantique situées au Sud de la partie aujourd'hui traitée dans les cartes I et II du Bulletin trimestriel ainsi que de la Méditerranée, et de les envoyer à Copenhague avec toutes les informations et notions hydrographiques ayant un intérêt d'actualité pour le trimestre.
4) L'impression se ferait à Copenhague, en deux langues: l'anglais et l'espagnol. Le Bulletin trimestriel paraîtrait comme à présent, environ six semaines après la fin de chaque trimestre.

Comité du Plancton.

Président: le Prof. Ostenfeld.
Le Comité se réunit à 10h a. m. le 28 Mai 1927.

On discute au sujet du pouvoir capturant comparatif des divers types de filets, et la résolution suivante est adoptée:

Il faudrait demander au Prof. Mielck, de Helgoland, de soumettre à une épreuve comparative, au point de vue du pouvoir capturant, les filets de Nansen et de Hensen, le filet standard et les autres filets à mailles semblables qui sont en usage, et un subside devrait lui être accordé pour lui permettre de faire face aux dépenses de cette investigation.

On présume que les Pays participants lui faciliteront ses recherches en lui prêtant les filets du type qu'ils emploient.

Le Professeur Gran donne un résumé des investigations du micro-plancton qu'il à conduites avec ses assistants, depuis 1916 jusqu'aujourd'hui, sur la côte de Norvège, en traitant spécialement des facteurs qui limitent le développement du plancton.

Le Dr. V. I. Pettersson fait rapport sur la nouvelle pompe à plancton qu'il à construite, à l'aide d'un subside du Conseil, et indique certaines améliorations qui se sont montrées nécessaires, à la suite d'un essai de l'instrument conduit dans les conditions de travail obtenues grâce à la courtoisie des Autorités de la Pêcherie norvégienne.

Il est recommandé qu'un subside devrait être accordé au Dr. V. I. Pettersson pour apporter à son nouvel appareil à plancton certaines améliorations que l'expérience a rendues désirables.

La proposition du Prof. Ostenfeld concernant la nomination d'un spécialiste pour étudier le développement de certains crustacés planctoniques est discutée, et la résolution suivante est adoptée:

With reference to the proposal by Prof. Ostenfeld the Committee recommended that a specialist should be asked to collate the results of the investigations of the life history etc. of some crustaceans which are important as fish food e. g. the Euphausiids and the larger Calanoids, but that the nomination of such an expert should be postponed until next year, as investigations of that kind are going on at the present time in different countries.

A proposal by Professor Brandt that the scope of the Plankton Committee should be extended to include the study of Benthos was discussed, and the following resolution was agreed:—

With reference to the proposal of the Kristiania meeting of 1901 regarding the investigation of the sea bottom the Committee, on the proposal of Professor Brandt, recommended that the formation of a section for the quantitative study of the Benthos should be considered.

Statistical Committee.

Chairman: Prof. D'Arcy W. Thompson.
The Committee met on May 23rd and 24th, 1927.

The Bulletin Statistique for 1924, recently published, was laid on the table.

Captain Schöning reported that the necessary statistical material for the 1925 Bulletin had been received from all countries, with three exceptions: viz. Finland, France and Iceland. Also that the statistics from Iceland for the years 1923—24 had been received a few days before the Meeting. The Committee expressed a strong hope that the statistics from these three countries, and especially from France, might soon be available, and expressed regret that publication of the Bulletin for 1925 was delayed for the want of them.

The Chairman communicated to the meeting certain reports which had been sent in by various countries as to the time when their national statistics are, or will be, available. Put briefly, the general result of these reports was as follows: that the statistics for any given year may be expected, in the case of England, Scotland, Germany and Poland, about 3—6 months after the end of the year; in Holland, 6—7 months; in Denmark, 9—10 months; in Sweden, 9—10 months (Göteborg), and 13 months (National statistics); in France, say 10 months.

Statistical material for 1926 is already in hand from England, Scotland and Poland.

In the case of Belgium it was reported that a new and greatly improved system of statistics had been established, and that their publication (in monthly parts) might be expected shortly.

The Committee then discussed the present form of the Tables printed in the Bulletin Statistique. No important alterations or omissions were recommended,

Au sujet de la proposition du Prof. Ostenfeld, le Comité recommande qu'il soit demandé à un spécialiste de collationner les résultats des investigations sur la biologie etc. de quelques crustacés qui sont importants comme aliment des poissons, tels que les Euphausiides et les grands Calanoides, — mais que la nomination d'un expert de ce genre soit ajournée jusqu'à l'année prochaine, parce que des investigations de cette nature sont en cours dans différents Pays.

Une proposition du Prof. Brandt tendant à étendre le programme du Comité du plancton de manière à y inclure l'étude du Benthos, est discutée, et la résolution suivante est recommandée:

En considération de la proposition de la réunion de Christiania, en 1901, au sujet de l'étude du fond de la Mer, le Comité, sur la motion du Prof. Brandt, recommande que la formation d'une section pour l'étude quantitative du Benthos soit examinée.

Comité Statistique.

Président: le Prof. d'Arcy W. Thompson.
Le Comité se réunit le 23 et le 24 Mai 1927.

Le Bulletin statistique pour 1924, récemment publié, est déposé.

Le Cap. Schöning déclare que le matériel statistique nécessaire pour le Bulletin de 1925 a été reçu de tous les Pays, à l'exception de trois: la Finlande, la France et l'Islande. La statistique d'Islande pour les années 1923—24 a aussi été reçue peu de jours avant la réunion. Le Comité exprime le vif espoir de disposer bientôt des statistiques de ces trois Pays, spécialement de la France, et regrette que la publication du Bulletin pour 1925 ait été retardée par suite de leur défaut.

Le Président communique à la réunion certains rapports envoyés par divers Pays au sujet de l'époque à laquelle leur statistique nationale est ou sera disponible. En abrégé, le résultat général de ces rapports s'établit comme suit: la statistique d'une année donnée peut être attendue, dans le cas de l'Angleterre, de l'Ecosse, de l'Allemagne et de la Pologne, de 3 à 6 mois après la fin de l'année, en Hollande, de 6 à 7 mois, en Danemark, de 9 à 10 mois, en Suède, de 9 à 10 mois (Göteborg), et 13 mois (statistique nationale), en France, probablement 10 mois.

Le matériel statistique pour 1926 est déjà fourni par l'Angleterre, l'Ecosse et la Pologne.

Dans le cas de la Belgique, il est annoncé qu'un système nouveau et bien amélioré de statistique est en voie d'organisation et que la publication par parties mensuelles peut être attendue à bref délai.

Le Comité discute ensuite la forme actuelle des tables imprimées dans le Bulletin statistique. Aucun changement important ou omission n'est recommandé,

but a considerable number of changes in detail were unanimously agreed to. The number of fishes separately dealt with was materially reduced; and other simplifications were considered and will be introduced in the next volume of the Bulletin.

Certain proposals standing in Mr. T. EDSER's name since the meeting in 1926 were considered by the Committee. Some of them were identical with changes already made in the Bulletin for 1924, others had been already included in the proposals adopted by the Committee; there remained an important proposal for a new Table, or Tables, which should record not only the quantity of fish caught, but also the "fishing power" expended thereon, in terms of number of voyages, of days absence, or (if possible) of hours actually spent in fishing — all for the several modes of fishing. The Committee considered this proposal with great interest and sympathy; and various members from the different countries expressed a hope that the information required might, at least in part, be gradually obtained. The matter was then left over to be discussed again at the meeting of the Committee in 1928.

Professor HENKING called attention to the fact that no clear boundary was defined, or was made use of in the statistical Tables, between the sea-fishery and that of the estuaries; he pointed out that this matter became of considerable importance, especially in the great rivers of continental Europe. Professor HENKING presented a resolution in the following terms:—

In the tables of Total Quantity and Value of fish landed, it should be made clear for each country whether the inshore, or coastal, fisheries are included with the rest; and if so, the boundary between these and the deep-sea fisheries should be clearly defined.

Furthermore, it should be made clear whether, or to what extent, boats fishing only in the inshore waters are included in the lists of fishing boats and vessels furnished by each country for the Bulletin Statistique.

And this proposal also after consideration and discussion, was referred to the next meeting of the Committee in 1928.

Limnological Committee.

Chairman: Prof. HENKING.

The Committee met on 28th and 30th May 1927.

Dr. ANDERSSON, Temporary Chairman, opened the proceedings.

Professor HENKING was elected Chairman of the Committee and took the chair at all the meetings.

A Report on "River Pollution and Fisheries" was received from Dr. REDEKE, but was not available to members of the Committee in time for consideration at the present meeting. A discussion was held on methods of marking salmon, and it was considered advisable that the various countries where such marking was

mais un grand nombre de changements de détails sont unanimement adoptés. Le nombre des poissons traités séparément est notablement réduit, et d'autres simplifications sont examinées et seront introduites dans le prochain volume du Bulletin.

Le Comité examine certaines propositions rattachées à une motion de Mr. T. Edser présentée à la réunion de 1926. Plusieurs d'entre elles se confondent avec des changements déjà introduits dans le Bulletin pour 1924, d'autres se trouvent incluses dans les propositions adoptées par le Comité; il reste une importante proposition: celle de dresser une ou plusieurs tables nouvelles indiquant non seulement la quantité de poisson capturé, mais encore la force motrice dépensée à sa pêche, en indiquant le nombre de voyages et de jours d'absence, ou, si possible, le nombre d'heures réellement passées en pêche, — le tout pour les différents modes de pêche. Le Comité examine cette proposition avec grand intérêt et sympathie, et plusieurs membres, de divers Pays, expriment l'espoir que l'information nécessaire pourra être obtenue, au moins en partie. La question est laissée pendante pour être reprise à la réunion du Comité en 1928.

Le Prof. Henking attire l'attention sur le fait qu'il n'y a pas de limite définie, — ou du moins qu'il n'en est pas tenu compte dans les tables statistiques, — entre la pêche de mer et celle des estuaires; il montre que cette question a pris une importance considérable, surtout dans les grande fleuves de l'Europe continentale. Le Prof. Henking présente une résolution dans les termes suivants:

Il est recommandé de renseigner si la capture des régions côtières est comprise dans les nombres statistiques des poissons débarqués dans chacun des Pays; pour autant que ce soit le cas, il faudrait établir à quelle distance de la terre la limite se trouve.

Il faudrait rechercher, en outre, si les navires qui pêchent dans la région côtière sont inclus dans les listes du Bulletin statistique.

Cette proposition aussi, après examen et discussion, est ajournée à la prochaine réunion du Comité, en 1928.

Comité Limnologique.

Président: le Prof. Henking.
Le Comité se réunit le 28 et le 30 Mai 1927.

Le Dr. Andersson, Président temporaire, ouvre la séance.

Le Prof. Henking est élu Président du Comité et occupe la chaire à toutes les réunions.

Un rapport sur la Pollution des Rivières et les Pêcheries a été reçu du Dr. Redeke, mais il n'a pu être mis à la disposition des membres à temps pour une prise en considération à la présente réunion. On discute les méthodes de marquage du saumon et on estime qu'il est à conseiller que les divers Pays, dans lesquels

being carried on should exchange information. In addition to the letters adopted for marking fish by Baltic countries (see Report of the Baltic Committee) the following letters are in use:— "A" in Spain, "F" in France and "I. F. S." in the Irish Free State.

Prof. HENKING gave an account of his investigations on racial characteristics of salmon and sea trout. Dr. JOHANSEN suggested that crosses between salmon and trout should be studied from the scientific point of view, but such crosses should be avoided in artificial propagation in hatcheries.

The following resolutions were adopted by the Committee:—

I) That Professor HENKING be asked to prepare a Report on Salmon and Sea Trout, with special reference to the following aspects:—

A) A brief account of the life-history of the Salmon and Sea Trout in each country.

B) Laws and Regulations governing the close seasons and size limits for Salmon and Sea Trout in each country.

The report should deal with Salmon and Sea Trout in all the participating countries and, so far as possible, in other countries of Europe where these fish occur.

II. That the Sub-Committee appointed for the study of Salmon in the area between Great-Britain, Ireland, France and Spain be asked to continue its work and that Prof. ROULE be re-elected as Reporter of the Sub-Committee.

III. That the programme adopted at the meeting in Copenhagen in September 1926 be re-adopted for the present year.

Editorial Committee.

Chairman: Prof. PETTERSSON.
The Committee met on 28th May 1927.

The Editorial Committee having considered the report of their Sub-Committee appointed for the purpose, recommended that a special volume commemorative of the 25th anniversary of the foundation of the Council be prepared and published in the formate of the Rapports.

It was estimated that the Volume would contain at least 300 pages, that the cost would be in the neighbourhood of 7.500 Kr. and that it would not in any case exceed 9000 Kr.

The volume should be prefaced by a short introduction which might be prepared by the President of the Council and Professor PETTERSSON, and should

ce marquage se pratique, échangent des informations. En outre des lettres adoptées pour le marquage des poissons dans les Pays Baltiques (Voir le rapport du Comité Baltique), les lettres suivantes seront employées: "A" en Espagne, "F" en France, et "I. F. S." dans l'Etat libre d'Irlande.

Le Prof. Henking donne un aperçu sur ses investigations sur les caractères de race du saumon et de la truite. Le Dr. Johansen suggère que les croisements entre le saumon et la truite devraient être étudiés au point de vue scientifique, mais que ces croisements devraient être évités dans les établissements de propagation artificielle.

Les résolutions suivantes sont adoptées par le Comité:

I. Que le Prof. Henking soit prié de préparer un rapport sur le saumon et sur la truite de mer, en portant spécialement son attention sur les points suivants:

A) Un bref aperçu de la biologie du saumon et de la truite de mer dans chaque Pays.

B) Les lois et règlements fixant la clôture des saisons et les limites de taille, pour le saumon et la truite de mer dans chaque Pays.

Ce rapport devrait traiter du saumon et de la truite de mer dans tous les Pays participants et, autant que possible, dans d'autres Pays d'Europe où ces poissons se rencontrent.

II) Que le Sous-comité nommé pour l'étude du saumon dans l'aire comprise entre la Grande Bretagne, l'Irlande, la France et l'Espagne, soit prié de continuer son travail, et que le Prof. Roule soit ré-élu Rapporteur du Sous-comité.

III) Que le programme adopté à la réunion de Copenhague en Septembre 1926 soit réadopté pour l'année courante.

Comité Editorial.

Président: le Prof. Pettersson.
Le Comité se réunit le 28 Mai 1927.

Le Comité éditorial ayant examiné le rapport du Sous-comité nommé dans ce but, recommande qu'un volume spécial commémoratif du 25ème anniversaire de la fondation du Conseil soit préparé et publié dans le format des Rapports.

On estime que ce volume comprendra au moins 300 pages et que son prix sera d'environ 7500 couronnes, il ne pourra en aucun cas dépasser 9000 couronnes.

Le volume aurait comme préface une courte introduction qui pourrait être préparée par le Président du Conseil et par le Prof. Pettersson, et il devrait aussi

also contain a number of memorial notices and portraits of distinguished men no longer living who have worked in or in connection with the Council.

It was considered necessary to appoint an Editor or an Editorial Sub-Committee for the purpose of preparing and issuing the volume and it was considered highly important that the volume should appear before the end of 1927.

Moray Firth Committee.

Chairman: Prof. HJORT.

The Committee met at 11,25 a. m. on 26th May 1927.

The Chairman laid the following two documents before the Committee.

a) The protocol of the meetings at Ostend prepared by Mr. H. J. CROWE.

The protocol had been circulated to the members and corrected by them. It was therefore accepted without discussion. It is not to be printed but to be kept on file at the office of the Bureau.

On the proposal of the Chairman the Moray Firth Committee recommended an honorarium to Mr. CROWE in grateful acknowledgment of the work done by him for the Committee.

b) The Report of the Moray Firth Committee.

The members had no corrections or additions to make. Some amendments of purely formal nature suggested by the Consultative Committee were accepted with the alteration only of the last word which should read "concerned" instead of "affected".

The Moray Firth Committee recommended that the Report of the Committee should be finally printed.

On the proposal of the Chairman it was recommended that the Report be sent to all Governments concerned to be treated as a confidential paper until the British Government, which was most interested in the problems and on whose initiative the study of the question had been undertaken, had fixed a date for the publication.

The Committee, on the other hand, considered it inopportune to take any action at present with regard to statements that had appeared in Dutch and English newspapers, since they now had ceased to take notice of the question.

contenir une série de notices mémoriales et de portraits d'hommes distingués qui ne sont plus et qui ont travaillé dans le Conseil ou en connexion avec lui.

Il sera nécessaire de nommer un Editeur ou un Sous-comité éditorial en vue de la préparation et de la publication du volume, et il sera hautement important que ce livre paraisse avant la fin de 1927.

Comité du Moray Firth.

Président: le Prof. Hjort.
Le Comité se réunit à 11h25 le 26 Mai 1927.

Le Président présente les deux documents suivants au Comité:

a) Le procès-verbal des réunions d'Ostende dressé par Mr. H. J. Crowe.

Ce procès-verbal a été distribué aux membres et corrigé par eux. Il est donc adopté sans discussion. Il ne sera pas imprimé mais sera placé en dépot au local du Bureau.

Sur la proposition du Président, le Comité du Moray Firth recommande l'attribution d'un honoraire à Mr. Crowe en reconnaissance du travail accompli par lui.

b) Le rapport du Comité du Moray Firth.

Les membres n'ont ni correction ni addition à y faire. Quelques amendements, de pure forme, suggérés par le Comité consultatif sont acceptés, avec une seule altération: celle du dernier mot, qui doit être "concerned" au lieu de "affected".

Le Comité du Moray Firth recommande que le Rapport du Comité soit définitivement imprimé.

Sur la proposition du Président, il est recommandé que le Rapport soit envoyé à tous les Gouvernements intéressés pour être traitée comme pièce confidentielle jusqu'à ce que le Gouvernement Britannique, qui est le plus intéressé dans ces problèmes et qui en a provoqué l'étude de cette question, ait fixé une date pour sa publication.

Le Comité, d'autre part, considère comme inopportun de prendre actuellement une mesure quelconque au sujet des articles qui ont paru dans les journaux hollandais et anglais, puisqu'ils ont cessé de s'occuper de la question.

Whaling Committee.

Meeting in Paris, 7th—9th April 1927.

Chairman: Prof. Johan Hjort.

The committee met at 10.30 a. m. on the 7th of April in the Institut Océanographique, Paris, and continued its meetings on the 8th and 9th. At the first meeting Mr. Théodore Tissier, Président de Section au Conseil d'Etat, and Vice President of the International Council welcomed the committee in the name of the French Government, and Professor Joubin in the name of the Institut Océanographique. On the 9th Mr. Leon Perrier, the Minister for the French colonies, and Mr. Tissier honoured the Committee by taking part in the closing meeting.

Present during the meetings were all the members of the Committee and the following gentlemen who took part in the work as guests of the Committee: Prof. Odón de Buen, Dr. Bowman, the members of the French Interministerial Committee for the protection of Whales, Mr. Pillault (representing the Foreign Office), MM. Gruvel and Pillias (Colonial Office), Mr. Lecourbe (Ministry of Public Works), and Mr. Pavie (Ministry of Marine).

The Committee accepted the following Agenda for its proceedings:—

I) Reviews by the members of the Committee of work which at present is being carried out by the different countries, and which may throw light on the whaling problems.
II) Discussion of biological problems connected with the whaling industry.
III) Discussion of recommendations for future work.
IV) Examination of concrete practical proposals suggested to the Committee.

I. Professor Gruvel, member of the French Interministerial Committee, in an introductory address spoke of his personal experiences in Africa, which had led him to the conviction that whaling as carried out was proving disastrous to the stock and explained how Dr. Charcot and he had agitated in favour of measures restricting capture, and had interested France in the project of an international investigation and cooperation for the benefit of the whaling industry. He described also the present situation of whaling in the French colonies.

Reviews of the whaling and the national investigations in the different countries were given by Messrs. Odón and Fernando de Buen for Spain, Mr. Borley for England, Mr. Jones for Scotland, Prof. Schmidt for Denmark and Prof. Hjort for Norway.

II and III. The Committee then entered into a discussion of the most important problems and of a programme for an international cooperation in the study of whales and the whaling industry. The following main items were especially considered.

Comité de la Baleine.

Réunion à Paris, 7—9 Avril 1927.

Président: le Prof. Hjort.

Le Comité se réunit à 10.30 a.m. le 7 Avril, à l'Institut océanographique, à Paris, et il y continue ses réunions le 8 et le 9. A la première réunion Mr. Théodore Tissier, Président de Section au Conseil d'Etat, et Vice-Président du Conseil international, souhaite la bienvenue au Comité, au nom du Gouvernment Français, et le Prof. Joubin au nom de l'Institut océanographique. Le 9, Mr. Léon Perrier, Ministre des Colonies, et Mr. Tissier honorent le Comité en assistant à la clôture de la réunion.

Tous les membres du Comité ont été présents aux séances, et les personnes suivantes ont pris part au travail en qualité d'hôtes du Comité: le Prof. Odón de Buen, le Dr. Bowman, les membres de la Commission française interministérielle pour la protection des baleines: Mr. Pillault, représentant le Ministre des Affaires Etrangères, MM. Gruvel et Pillias, représentant le Ministre des Colonies, Mr. Lecourbe, représentant le Ministre des Travaux Publics, et Mr. Pavie, représentant le Ministre de la Marine.

Le Comité adopte les Agenda suivants pour ses travaux:

I) Exposé par les membres du Comité, des travaux actuellement entrepris dans les différents pays qui sont de nature à donner quelque lumière sur les problèmes ayant trait à la chasse aux Cétacés.
II) Discussion des problèmes biologiques ayant trait à l'industrie des Cétacés.
III) Discussion des résolutions concernant un programme de travail.
IV) Examen de propositions concrètes d'ordre pratique qui seraient apportées au Comité.

I. Le Prof. Gruvel, membre de la Commission française interministérielle, parle, dans un discours introductif, de son expérience personnelle en Afrique, qui l'a conduit à la conviction que la chasse à la baleine telle qu'elle se pratique, se montre désastreuse pour le stock. Il expose la campagne qu'il a conduite, avec le Dr. Charcot, en faveur de mesures restrictives de la capture et l'intérêt qu'ils ont suscité en France en faveur d'une investigation et d'une coopération internationales pour le bien de l'industrie baleinière dans les Colonies françaises.

Des revues de la chasse à la baleine et des investigations nationales conduites dans les divers Pays, sont présentées par MM. Odón et Fernando de Buen, pour l'Espagne, Mr. Borley, pour l'Angleterre, Mr. Jones, pour l'Ecosse, le Prof. Schmidt, pour le Danemark, et le Prof. Hjort, pour la Norvège.

II et III. Le Comité entame alors la discussion des plus importants problèmes et d'un programme de coopération internationale pour l'étude des baleines et de l'industrie baleinière. Les points suivants ont été spécialement examinés.

1) Statistics.

The Committee accepted the principle of the preparation of two kinds of statistics.

a) Statistics collected through the co-operation of the whalers. It was agreed that the aim should be to collect only such information as could be furnished easily by the whaling stations, especially the following: date, species, length of the whale, sex, place of capture, food of the whale, length of foetus, together with ordinary commercial statistics.

b) Biological statistics to be prepared where competent observers were connected with the whaling stations. It was agreed to ask Mr. Borley to prepare a memorandum on this subject on the basis of the experience gained during the Discovery expedition. Mr. Borley declared his willingness to do so[1]).

2) Plankton.

The Committee agreed to aim at an international co-operation for the study of such plankton animals as play the most important rôle in the food of the whales, viz: the copepods and the schizopods.

For the study of the Copepods it was agreed to make use of some standard gear and to adopt a quantitative method (volumetric or gravimetric) of estimating quantities, with the object in view of studying the life history (development, quantitative distributions of stages at different periods of the year and at characteristic localities) at as many places as possible along a line from Norway and Iceland in the North to the French Colonies in the South, at the same time keeping in touch with the investigations of the Discovery in the Antarctic. It was considered that special attention should be directed towards the situation in the sea before the development of the phytoplankton, during this development and the following phases of quantitative occurrence of the important species of zooplankton during summer and autumn.

The life history of the most important Schizopods such as *Meganyctiphanes norvegica* in the North, should be studied on similar lines. It was agreed that special attention should be given to the spawning period, when the animals are concentrated on narrow characteristic spawning areas marked by characteristic conditions and on which whales appear at the same time.

3) Shore investigations.

Mr. Borley reviewed the work of the Discovery expedition, which had collected many observations for the identification of species or races, to determine the length at which a whale becomes mature, the duration and the fre-

[1] On the meeting at Copenhagen May 25th Mr. Borley placed the note appended at the disposal of the Committee.

1) Statistique.

Le Comité accepte le principe de la préparation de deux genres de statistique:

a) Statistique recueillie grâce à la coopération des baleiniers. On convient qu'il ne faut chercher à recueillir ainsi que l'information qui peut être aisément fournie par les stations baleinières et, en particulier, les suivantes: la date, l'espèce, la longueur de la baleine, le sexe, le lieu de la capture, la nourriture de la baleine, la longueur du foetus, en même temps que les données statistiques commerciales ordinaires.

b) Statistiques biologiques, à dresser là où il y a des observateurs compétents en rapport avec les stations baleinières. On convient de demander à Mr. Borley de préparer un memorandum sur ce sujet, basé sur l'expérience acquise au cours de l'expédition du Discovery. Mr. Borley se déclare disposé à le faire.[1])

2) Plancton.

Le Comité convient de chercher à établir une cooperation internationale pour l'étude des animaux planctoniques qui jouent le rôle le plus important dans l'alimentation des baleines, c'est-à-dire les copépodes et les schizopodes.

Pour l'étude des copépodes, on décide de faire usage d'un appareil standard et d'adopter une méthode quantitative (volumétrique ou gravimétrique), pour évaluer les quantités en vue de l'étude de la biologie de ces crustacés (développement, distribution des stades à différentes périodes de l'année, et localités caractéristiques), sur le plus de points possible le long d'une ligne allant de de la Norvège et de l'Islande, au Nord, jusqu'aux colonies françaises, au Sud, tout en conservant contact avec les investigations du Discovery dans l'Antarctique. Il est entendu qu'il faudra accorder une attention spéciale à la condition de la mer avant le développement du phytoplancton, puis pendant ce développement et, subséquemment, pendant les phases d'abondance des espèces planctoniques importantes, au cours de l'été et de l'automne.

La biologie des espèces les plus importantes de schizopodes, telles que le *Meganyctiphanes norvegica* dans le Nord, devrait être étudiée de la même manière. On convient qu'il faudra accorder une attention spéciale à la période de la reproduction, pendant laquelle ces animaux se rassemblent en des aires étroites, caractérisées par des conditions bien marquées, et dans lesquelles les baleines apparaissent en même temps.

3) Recherches à terre.

Mr. Borley passe en revue le travail de l'expédition du "Discovery" qui a recueilli beaucoup d'observations utiles pour l'identification des espèces et des races, et pour la détermination de la longueur à laquelle une baleine devient

[1]) A la réunion du 25. Mai à Copenhague, Mr. Borley a mis à la disposition du Comité la note figurant en annexe.

quency of the gestation, the age etc. and said that much of this work could be undertaken only by a trained embryologist. Mr. BORLEY agreed to include the work on such problems in the memorandum, which he had promised to prepare. It was agreed to collect observations on the thickness of the blubber by making measurements at fixed and agreed positions.

IV. A draft convention for the regulation of the catch of whales outside the territorial waters, which had been prepared by the French Interministerial Committee was brought to the notice of the Committee.

It was decided that the terms of reference of the Committee would only permit the study and examination of this document. No resolution was therefore adopted on the subject, but a discussion took place for the purpose of elucidating leading ideas and points of view underlying the proposed regulations.

It was decided that a detailed protocol of this discussion should be prepared for the consideration of the International Bureau.

Appendix.

Note on Investigations based on observations at Whaling Stations.

This note has been written at the request of the Committee, through their Chairman. It is intended to help in securing uniformity of method and consequently comparability of results in all the researches made in connection with whaling by the countries represented on the Committee. Such uniformity has been sought assiduously in the Discovery Investigations and the work of Prof. HJORT, and as in the former of these researches a large staff will be engaged over several years, they should yield a useful body of results for comparison with results obtained in regions intermediate between the waters explored in the North and the Antarctic. It will be well therefore to glance at the nature of the work undertaken by the Discovery Committee.

The groundwork of the main lines to be followed was laid down in the Report of the Interdepartmental Committee on Research and Development in the Falkland Islands' Dependencies (London 1920). The recommendations made by this Committee, in as far as they related to research on problems connected with whaling, were based chiefly on appendices written by Sir SIDNEY HARMER (App. VIII) on whales and whaling and the present writer (App. XVI) on researches ancillary to the direct study of whales.

It is clear that while complete information as to the biology and ecology of whales is necessary for the most economic utilisation of the supply, the most pressing needs were to ascertain whether the stock exploited on a given ground (in this case S. Georgia, S. Shetlands, etc.) was being depleted to a degree endangering the future of the industry, and to determine as far as possible what number of whales

mature, de la durée et de la fréquence de la gestation, de l'âge etc. Il dit qu'une grande partie de ce travail ne peut être entreprise que par un embryologiste entraîné. Mr. Borley accepte de faire entrer son travail sur ces questions, dans le memorandum qu'il a promis de préparer. On convient de recueillir des observations sur l'épaisseur du lard, en faisant faire des mensurations en des points du corps déterminés et fixes.

IV. Un projet de convention pour la réglementation de la capture des baleines en dehors des eaux territoriales, qui a été préparé par la Commission française interministérielle, est porté à la connaissance du Comité.

Il est déclaré que les termes de référence du Comité ne permettent que l'étude et l'examen de ce document. Aucune résolution n'est donc adoptée sur le sujet, mais une discussion prend cours pour élucider les idées directrices et les points de vue qui sont à la base des réglementations proposées.

Il est décidé qu'un procès-verbal détaillé de cette discussion sera dressé et soumis au Bureau International.

Appendice.

Note basée sur des observations faites dans des stations baleinières.

Cette note a été écrite à la demande du Comité, par l'entremise de son Président. Elle a pour but d'aider à assurer l'uniformité des méthodes, et conséquemment, la comparabilité des résultats dans toutes les recherches relatives à l'industrie baleinière des Pays représentés au Comité. Cette uniformité a été recherchée assiduement dans les investigations du Discovery et dans le travail du Prof. Hjort, et, comme un nombreux personnel sera occupé dans les premières pendant plusieurs années, il en sortira une masse importante de résultats à comparer avec les résultats obtenus dans les régions intermédiaires entre les eaux explorées dans le Nord et dans l'Antarctique. Il sera donc bon de jeter un coup-d'oeil sur le travail entrepris par le Comité du Discovery.

Le plan des grandes lignes à suivre a été esquissé dans le "Report of the interdepartmental Committee of Research and Development in the Falkland Islands' Dependencies" (London, 1920). Les recommandations de ce Comité relatives à des problèmes intéressant l'industrie baleinière étaient basées principalement sur des notices écrites en annexes par Sir Sidney Harmer (App. VIII), sur les baleines et sur l'industrie baleinière, et par l'auteur de la présente note (App. XVI), sur les recherches auxiliaires de l'étude directe des baleines.

Il est clair que, tandis que des informations complètes sur la biologie et l'écologie des baleines sont nécessaires pour l'utilisation la plus économique de la production, le besoin le plus pressant est de s'assurer si le stock exploité dans une région donnée, (dans le cas présent la Géorgie du Sud et les Shetlands du Sud, etc.) est en voie d'épuisement au point de faire péricliter l'avenir de l'industrie, et de

could be taken annually without incurring this result. It was realised that one of the first branches of enquiry to be undertaken was the study of the identity of the whales taken on the Southern Whaling fields — as to whether they were of the same stock as those taken in other regions, and even in Arctic waters. Solution of this question is assisted if the specific identity or difference of the South Georgia and other whales is established, but it is not necessarily completed since local races, if such exist, may be disastrously depleted notwithstanding the existence in neighbouring waters of other local races of the same species. In addition therefore to morphological examination, the study of migrations was undertaken. It is of course common knowledge that most extensive migrations of whales are known, but it was felt to be necessary to both extend this knowledge and make it more definite and exact. The facts as to migration should, it was felt, be sought by both comparison of whaling seasons (for the same species) and by marking experiments, the marking being carried out particularly, if possible, in areas not intensively worked by whalers. Another branch of the enquiry into depletion was naturally the study of both the age and size at first maturity so that the rate of reproduction might be estimated and so that of replenishment. Observations as to the condition of whales at different seasons (in respect of quantity and oil content of blubber) were added to these essential researches.

While these researches would, it was hoped, ascertain many actual facts as to the whales, their rationale and in some cases their bearing could, it was felt, be appreciated only when viewed in the light of the conditions in which the whales lived. Should, for instance, the locus of the main body of a given species be due to feeding habits, and the distribution of the food species fluctuate from year to year, now nearer now more remote from a whaling base such as South Georgia, a fictitious appearance of abundance or dearth might be given to the statistics, which otherwise would furnish most valuable evidence as to the state of the stock. Investigations were therefore desired into the food of the whales, study of the distribution in nature of the food species, and the causes (mainly hydrographic) affecting their abundance and the movements of the aggregations in which, (in the case at least of the plankton organisms) they might be expected to be found.

With this, the sea branch of the work, this note is not intimately concerned. It may be remarked, however, that as finally drafted by Dr. Kemp, the initial programme adopted for the plankton work involved the use of four standard types of net, with mesh decreasing in size from the mouth to the end, to facilitate filtration. The particulars of these nets are as follows:

déterminer, autant que possible, le nombre de baleines que l'on peut capturer annuellement sans risquer d'aboutir à ce résultat. On se rend compte que l'une des principales branches de l'enquête à entreprendre est l'étude de l'identité des baleines capturées sur les Champs Baleiniers du Sud: il faut savoir si elles sont du même stock que celles qui sont capturées dans d'autres régions et même dans les eaux arctiques. La solution de cette question sera facilitée si l'identité ou la différence des baleines de la Géorgie du Sud et d'autres baleines est établie, mais cette solution n'en serait pas pour cela nécessairement complète, parceque des races locales — s'il en existe — pourraient être désastreusement épuisée nonobstant l'existence dans des eaux voisines, d'autres races locales de la même espèce. Aussi, outre l'examen morphologique, l'étude des migrations a-t-elle été entreprise. Les migrations très étendues des baleines sont, en effet, de connaissance vulgaire, mais on a trouvé nécessaire à la fois d'étendre cette connaissance et de la rendre mieux définie et plus exacte. On a reconnu que les faits concernant la migration devraient être recherchés à la fois par la comparaison des saisons baleinières, (pour la même espèce), et par des expériences de marquage, celui-ci devant être poussé particulièrement, si c'est possible, dans des aires qui ne sont pas trop intensément exploitées par les baleiniers. Une autre branche de l'enquête sur l'épuisement est, naturellement, l'étude de l'âge et de la taille à la première maturité, qui permettrait d'estimer la rapidité de la reproduction et de la réfection du stock. Des observations sur la condition des baleines à diverses saisons (au point de vue de la quantité d'huile contenue dans le lard [blubber]) s'ajoutent à ces recherches essentielles.

On espère que ces recherches révèleront beaucoup de faits réels au sujet des baleines, mais leur raison d'être et parfois leur portée, ne pourront être appréciés qu'à la lumière des conditions dans lesquelles les baleines vivent. Ainsi, par exemple, le lieu de rassemblement du corps principal d'une espèce donnée pourrait bien être déterminé par leurs habitudes alimentaires et la distribution des espèces alimentaires, sujette à fluctuer d'année en année, tantôt plus près, tantôt plus loin d'une base baleinière, telle que la Géorgie du Sud, pourrait donner une apparence fictive d'abondance ou de disette à une statistique qui, autrement, fournirait une très précieuse indication sur l'état du stock. Ainsi est-il à désirer que des investigations se poursuivent sur la nourriture des baleines, y compris l'étude de la distribution des espèces alimentaires dans la nature et des causes (surtout hydrographiques) qui affectent l'abondance et les déplacements des aggrégations dans lesquelles on peut s'attendre à les trouver (au moins dans le cas d'organismes planctoniques).

Cette note ne concerne pas étroitement cette branche marine du travail. Cependant on remarquera que, tel qu'il a été définitivement rédigé par le Dr. Kemp le programme initial du travail planctonique comprenait l'emploi de quatre types standard de filets à mailles de dimensions décroissantes de l'entrée au bout, pour faciliter la filtration. Les caractéristiques de ces filets sont les suivantes:

	Diameter of mouth	Mesh at middle	Mesh at end	Hauled	Speed
1.	70 cm.	Coarse silk	Medium silk	Vertically	1 m. pr. sec.
2.	1 m.	4.5 mm.	Coarse	Horizontally	$1^1/_2$—2 knots
3.	2 m.	7 mm.	4.5 mm.	—	3—4 —
4.	$4^1/_2$ m.	15 mm.	7 mm.	—	„ —

Other nets, of very fine silk, of the pattern employed by Prof. GRAN, and 50 cms. across the mouth, are used for the smallest organisms, as is a centrifuge; and as the Committee has been informed, an apparatus for the continuous collection of plankton has proved effective.

In addition to the collection of biological and hydrographic material, it may be added that observations are made as occasion arises as to the species of whales sighted, together with their direction and apparent speed of movement, periods of submergence and exposure and distribution in relation to ice, plankton etc., wherever such observations are practicable.

The shore work on whales, which has been carried out not only at S. Georgia but at Saldanha Bay and Durban may now be mentioned in somewhat greater detail. It was intended to pursue as many as possible of the following lines:—

1) Specific distinctions and possible distinctions of North and South whales.

A) Colouration, external and mouth (including baleen).
B) Position of apertures in relation to dorsal fin.
C) Various body measurements.
D) Collection of various bones for comparison with Northern specimens: e. g. Nasals (both), tympanics, atlas and axis vertebrae.
E) A skeleton of adult of each species: the flippers unflayed.
F) Occurrence of external parasites (including copepoda on the baleen) and of diatom film.
G) Size and sex — required also for other purposes than specific distinctions — to be determined independently of the whaling hands and as a check on the returns of the latter.

2) Rate of replenishment of stock.

A) Foetuses. To be sought measured and recorded with length of mother in all cases, so that those too small to attract whalers' attention are noted.
B) Ovaries to be examined wherever possible, for corpora lutea and other features of importance.
C) Size at which a species becomes adult to be studied by condition of certain of the bones (e. g. Axis vertebra and one vertebra from lumbar and caudal region) and skulls.
D) (related to C) Measurements of baleen of whales of known length.

	Diamètre à l'entrée	Mailles au milieu	Mailles au bout	Halage	Vitesse
1.	70 cm.	soie grossière	soie moyenne	vertical	1 m. par sec.
2.	1 m.	4,5 millim.	soie grossière	horizontal	$1^1/_2$—2 noeuds
3.	2 m.	7 millim.	4 à 5 mill.	—	3—4 noeuds
4.	$4^1/_2$ m.	15 millim.	7 millim.	—	— —

D'autres filets de soie très fine, de la forme employée par le Prof. Gran et de 50 cent. à l'entrée, sont employés pour les plus petits organismes, qui sont de plus centrifugés; et, ainsi que le Comité en a été informé, il existe un appareil pour la prise continue du plancton qui s'est montré effectif.

Outre la réunion de matériel biologique et hydrographique, on peut ajouter que des observations sont faites, quand l'occasion s'en présente, sur l'espèce des baleines aperçues, ainsi que sur les directions et la vitesse apparente de leur déplacement, sur leur période de submersion et d'émersion et sur leur distribution par rapport à la glace ou au plancton etc., partout où ces observations sont practicables.

Le travail à terre sur les baleines, qui a été accompli non seulement en Géorgie du Sud mais à la baie de Saldanha et à Durban, peut être mentionné ici avec quelque détail. On a l'intention de le poursuivre dans le plus grand nombre possible des voies suivantes:

1) Détermination des espèces et distinction possible entre baleines du Nord et baleines du Sud.

A) Coloration, externe et intrabuccale (y compris celle des fanons).
B) Position des orifices par rapport à la nageoire dorsale.
C) Différentes mensurations du corps.
D) Réunion de divers os pour la comparaison avec les spécimens du Nord: les os nasaux, les tympaniques, l'atlas et l'axis.
E) Un squelette d'adulte de chaque espèce, la palette non écorchée.
F) Rencontre de parasites externes (y compris les copépodes sur les fanons) et d'une pellicule de diatomées.
G) La taille et le sexe — données réclamées dans d'autres buts encore que la détermination — doivent être déterminés indépendamment des équipages baleiniers et comme contrôle de leurs indications.

2) Rapidité de la réfection du stock.

A) Foetus. On cherchera à les mesurer et à noter les donnés, avec la taille de la mère, dans tous les cas, afin que ceux qui sont trop petits pour attirer l'attention des baleiniers n'échappent pas à l'investigation.
B) Les ovaires. Les examiner partout où c'est possible, au point de vue des corps jaunes et d'autres détails importants.
C) Taille à laquelle une espèce devient adulte; — à rechercher d'après la condition de certains os (axis, une vertèbre lombaire et une vertèbre caudale) et du crâne.
D) Mesures des fanons de baleines d'une taille donnée (en rapport avec C).

E) (also bearing on C) the abundance (and species) of parasites, external and internal.

3) Food.

It is obvious that not all of these lines of work, (which were suggested by Sir S. F. Harmer, though not in quite this form) could be attempted at once. As a matter of fact progress has been made by the Discovery staff in the majority of them. Some were elaborated in much greater detail by Mr. MacIntosh at a later date. A detailed embryological scheme for the conduct of the observations was prepared by him. Thus diagnosis of maturity and of the condition of the organs in the breeding season, the number of pregnancies likely to have taken place, and the like were included; while the number of body measurements carried out was fixed in the first instance at twenty five. Another line of work was taken up (I believe on Dr. Kemp's suggestion) in recording the thickness of blubber at determined positions, while a start has been made by Mr. Clowes at determining by analysis the fat content of the blubber. No purpose would be served by burdening this note with the whole of the particulars of these researches.

The scheme of work outlined above, while making no claim to completeness, contains so much that is obviously essential that many of its branches are, and will be, in process of execution on other whaling grounds. The outline will perhaps be of service to those in charge of such researches as a reminder of cognate work and of the possibility of discussion of methods with colleagues. The purpose of the present note is to select such items as appear both essential and sufficiently simple to lead to the hope that they may be taken up (or if in progress pursued along standard lines) at representative stations down the whole length of both Atlantics.

The suggestions may be grouped under the main heads of the above scheme, and some others.

1) Specific and racial distinctions.

A) Colouration. Particular record to be kept of the colour of *a*) the lower surface, *b*) the tail flukes, *c*) baleen plates and baleen fibres — whether white plates occur in the baleen series, and at what position, or whether most of the plates are definitely striped, and of what colour.

C) Body measurements. The most essential are: *a*) Length from tip of snout to notch of flukes, *b*) Notch of flukes to anus, *c*) Length of severed head from tip of snout to condyle, *d*) Tip of snout to axilla, *e*) Axilla to tip of flipper, *f*) Width of flukes at insertion, *g*) Tip of snout to eye, *h*) Vertical height of dorsal fin. The following are desirable also: *i*) Eye to ear, *j*) Greatest breadth of flipper, *k*) Dorsal fin to notch of flukes.

F) External parasites and barnacles. Species and abundance.

G) Sex and Length. Measured from tip of snout to notch between flukes of tail.

E) Abondance (et espèce) des parasites externes et internes (également en rapport avec C).

3. Alimentation.

Il est clair qu'on ne peut pas tenter de travailler à la fois dans toutes ces directions (qui ont été indiquées par Sir S. F. Harmer, sous une forme un peu différente). En fait, le personnel du "Discovery" a marché dans la plupart d'entre elles. Quelques voies de recherches ont été élaborées plus tard avec beaucoup plus de détails par le Prof Mac. Intosh, qui a préparé un plan pour la conduite des observations embryologiques. Citons: la diagnose de la maturité et de la condition des organes pendant la saison de la reproduction, le nombre probable des gravidités précédentes, fixation des mensurations à prendre en premier lieu, au nombre de 25. Une autre voie de travail a été suivie (à la suggestion du Dr. Kemp, je pense) — du côté de la notation de l'épaisseur du lard en certains points fixes. Enfin M. Clowes a commencé à déterminer par l'analyse la quantité d'huile contenue dans ce lard. Il ne servirait à rien de charger cette notice de tous les détails de ces recherches.

Le plan de travail esquissé ci-dessus, sans avoir la prétention d'être complet, contient cependant tant de choses essentielles, que beaucoup de ses parties sont déjà ou seront bientôt, mises en voie d'exécution dans d'autres régions baleinières. Cette esquisse sera peut-être de quelque utilité à ceux qui sont chargés de recherches de ce genre, en leur rappelant l'existence de travaux parallèles et leur signalant l'occasion de discuter les méthodes avec des collègues. Le but de cette notice est de mettre en relief certains points qui paraissent à la fois essentiels et assez simples pour faire espérer qu'on pourra les aborder en des stations représentatives sur toute la longueur des deux Atlantiques. Or, si leur étude est déjà entreprise, qu'on pourra les conduire sur des lignes convenues ou "standard".

Les propositions peuvent être groupées sous divers titres tirés du plan ci-dessus ou de certains autres.

1) Distinction des espèces et des races.

A) Coloration. Noter particulièrement la couleur: a) de la face inférieure, b) des palettes caudales, c) des fanons, lames et fibres d'effilochage — noter s'il existe des plaques blanches dans la série des fanons et dans quelle position, noter aussi si la plupart des lames sont nettement striées et en quelle couleur.

C) Mesures du corps. Les plus essentielles sont: *a*) longueur du bout du museau à l'encoche des nageoires, *b*) de l'encoche des nageoires à l'anus, *c*) longueur de la tête coupée depuis le bout du museau jusqu'au condyle, *d*) du bout du museau à l'aisselle, *e*) de l'aisselle au bout de la nageoire, *f*) largeur des nageoires à leur insertion, *g*) du bout du museau à l'oeil, *h*) hauteur verticale de la nageoire dorsale. Les mesures suivantes sont aussi désirables: *i*) de l'oeil à l'oreille, *j*) la plus grande largeur des nageoires, *k*) de la nageoire dorsale à l'encoche des nageoires.

F) Parasites externes et balanes. Espèce et abondance.

G) Sexe et longueur mesuré du bout du museau jusqu'à l'encoche qui est entre les palettes caudales.

2) Rate of replenishment of stock.

A) Foetuses. Careful records of number, length, length of mother and date.

B) Where embryologist available, examination of ovaries and other genitalia.

3) Food.

Records to be kept in as precise terms as possible. Where no experienced naturalist at work adequate samples to be taken at regular (e. g. monthly) intervals and sent to a competent zoologist (who should be the expert concerned in the plankton work related to the station) for examination and identification. It is suggested that jars should be provided for the samples, each containing a smaller bottle or jar holding sufficient formalin to make the contents of the jar after filling with material and sea water equivalent to at least 5 per cent. of formaldehyde. Experience may show that the strength would need to be greater. Label of tough paper to be included in each jar with entries in soft pencil stating kind, length and number of whale, so that the whale may be traced in the records received from the station.

4) Blubber.

Thickness to be determined at two standard positions in all cases, whether at other positions or not. *a*) At the flank, opposite the tip of the dorsal fin. *b*) In the mid-dorsal line in front of the dorsal fin.

Such fat determinations as have been made in the Discovery work have been carried out from samples roughly of 6 inches in each direction taken from the former positions: larger samples may be desirable, owing to the need of "averaging" the condition of the blubber, which in places is rendered poorer in fat by abundant connective tissue. Parts only of these samples would be used in extraction, the whole sample being finely minced and mixed and remixed before division.

5) Statistics.

In addition to full commercial statistics, it will be seen that the suggestion is made of collecting records of total length of the occurrence and length of foetuses, and of food, as well as certain body measurements. Where a scientific observer is not stationed the body measurements of a detailed character can hardly be expected, and the statistical form of the Danish type appears adequate. It is important that each whale be numbered. Where an observer is available it is desirable that the recording forms he uses should contain spaces for each of the detailed measurements, as well as for the particulars given by the common form, and that the latter wherever possible should be independently determined by the observer, a note being entered marking any measurement he has not himself made.

2. Rapidité de la réfection du stock.

A) Foetus. Notation soigneuse du nombre, de la longueur, de la taille de la mère et de la date.

B) S'il y a un embryologiste, examen des ovaires et des autres organes génitaux.

3. Alimentation.

Notes à tenir en termes aussi précis que possible. Là où il n'y a pas de naturaliste compétent, de bons échantillons doivent être pris à des intervalles réguliers (tous les mois par exemple) et envoyés à un zoologiste pour examen et détermination. Ce zoologiste devrait être celui qui est chargé du plancton de la station. On a proposé de fournir pour les échantillons des bocaux renfermant chacun une petite bouteille contenant la quantité de formol nécessaire pour que le remplissage par de l'eau de mer avec les objets donne une concentration d'au moins 5 pourcent de formaldéhyde. L'expérience montrera peut-être que la solution devrait être plus forte. Une étiquette de papier durci devrait être introduite dans chaque bocal et porter, inscrite au crayon noir, l'indication de l'espèce, de la longueur et du numéro de la baleine, de telle sorte que l'on puisse retrouver celle-ci dans les données reçues de chaque station.

4. Lard.

Son épaisseur doit être indiqué en deux points fixes, en tout cas, qu'elle soit ou non déterminée en d'autres points encore: a) sur le flanc au niveau du bout de la nageoire dorsale, b) sur la ligne médiane dorsale devant la nageoire dorsale.

Les déterminations de la graisse à bord du "Discovery", ont été faites sur des échantillons d'environ 6 pouces en chaque direction, prélevés aux deux points indiqués. Des échantillons plus grands sont peut-être à désirer à cause de la nécessité qu'il y a d'indiquer la "moyenne" de la condition du lard qui, en des points divers, peut devenir plus pauvre en graisse par suite d'un plus grand développement du tissu conjonctif. Des parties seulement de ces échantillons peuvent être soumises à l'extraction, mais l'échantillon tout entier doit avoir été au préalable haché, mélangé et remélangé, avant d'être divisé.

5. Statistique.

Outre la statistique commerciale complète, il est proposé, à ce qu'on voit, de recueillir les données de la rencontre et de la longueur des foetus et de la nourriture, ainsi que de certaines mesures du corps. Là où il n'y a pas d'observateur scientifique, on peut à peine espérer des mensurations détaillées du corps et la formule statistique du type danois paraît convenir. Il est important que chaque baleine soit numérotée. Là où il y a un observateur scientifique, il est à désirer que les formules qu'il emploie contiennent des places prévues pour chacune des mensurations détaillées, outre les données fournies par les formules ordinaires, ces dernières, partout où c'est possible, devraient être déterminées par l'observateur, indépendamment des données ordinaires, une note indiquant bien toute mensuration qui n'a pas été faite par lui.

If widely secured, records of the points mentioned in these suggestions would be of the greatest service. Reliable dated records of foetal occurrences and lengths would go far to determine the gestation period and cast light on the rate of reproduction. The records of colour and baleen and the body measurements (most of which were selected by Sir S. F. HARMER) would be of great value in the determination of species or race (as indeed would the widespread recording of total lengths), while the total lengths would bear on the shoaling of whales, their migrations and on the size composition of the stock. The blubber observations would bear directly on the point as to oil production raised by Prof. HJORT in Committee.

20th May 1927.

J. O. BORLEY.

Meeting at Copenhagen, 25th May 1927.

Chairman: Prof. HJORT.

The Chairman opened the meeting at 3 p.m. and welcomed the new members, the Director of Fisheries, LÜBBERT, from Germany, and Dr. RAMALHO from Portugal.

Point 1 of the Agenda:-Revision of the draft Procès-Verbal of the meetings at Paris.

The Chairman pointed out that this Procès-Verbal was only a draft. It had been distributed to all members, and he proposed that each member should hand his amendments to the Secretary so that the final form of the Procès-Verbal could be prepared. This was agreed.

The Chairman further proposed that the Procès-Verbal be reproduced in typescript or printed in 100 or 200 copies and that the International Council be asked to send this revised Procès-Verbal to the participating Governments for their information and for discussion with their experts. This was agreed.

Dr. RAMALHO said that he was sorry that Portugal — though very interested in these problems — through the death of the Colonel Chaves and an unfortunate combination of events had been prevented from nominating a member to this Committee and consequently had been unable to take part in the work. He himself had received the Report only for an hour ago and was not yet acquainted with its contents. Portugal could therefore in no way accept responsibility for the Report.

The Chairman expressed his great regret for that Portugal unfortunately had been prevented from participating in the work that had been done and promised that the position of Portugal should be made clear— though nothing could be added to the Procès-Verbal of the Paris meeting.

Largement assurée la réunion des indications mentionnées dans ces suggestions rendraient les plus grands services. L'indication sûre des rencontres de foetus et des longueurs contribuerait déjà sérieusement à la détermination de la durée de la gestation et jetterait de la lumière sur la question de la rapidité de la reproduction. La notation de la couleur du corps et des fanons et les mensurations du corps (dont beaucoup ont été choisies par Sir S. F. Harmer) serait d'une grande valeur pour la détermination de l'espèce ou de la race, comme le serait assurément aussi l'indication largement répandue de la longueur totale. Les longueurs totales auraient une portée dans l'étude de l'attroupement des baleines, de leurs migrasions et de la composition du stock au point de vue de la taille. Les observations sur le lard auraient des rapports directs avec la question de la production de l'huile toulevée au comité par le Professeur Hjort.

20 Mai 1927. J. O. Borley.

Réunion à Copenhague le 25 Mai 1927.

Président: le Prof. Hjort.

Le Président ouvre la réunion à 3 h. p.m., et souhaite la bienvenue aux nouveaux membres, Mr. Lübbert, Directeur des Pêches, d'Allemagne, et le Dr. Ramalho, du Portugal.

Point 1 des Agenda: Révision du projet de procès-verbal des réunions de Paris.

Le Président fait remarquer que ce procès-verbal n'était qu'un projet. Il a été distribué à tous les membres, et il est proposé que chacun transmette ses amendements au Secrétaire, afin que la forme définitive de ce procès-verbal puisse être préparée. Adopté.

Le Président propose ensuite que ce procès-verbal soit reproduit en dactylographie ou en impression, à 100 ou 200 exemplaires et que le Conseil international soit prié d'envoyer ce procès-verbal révisé aux Gouvernments participants pour leur information et discussion avec leurs experts. Adopté.

Le Dr. Ramalho regrette que le Portugal, bien que fort intéressé dans ces problèmes, par suite de la mort du Colonel Chaves et d'une malheureuse combinaison d'événements, n'ait pas pu nommer un membre à ce Comité, et, conséquemment, ne se soit pas trouvé à même de prendre part au travail. Pour sa part, il n'a reçu le rapport que depuis une heure, et il n'en connait pas encore le contenu. Le Portugal ne peut donc accepter aucune responsabilité de ce rapport.

Le Président exprime son grand regret pour que le Portugal a été aussi malheureusement empêché de participer au travail et promet que la position du Portugal sera tirée au clair, bien que rien ne puisse être ajouté au procès-verbal de la réunion de Paris.

Dr. RAMALHO suggested that the work would have to be considered as done without the co-operation of Portugal whose contribution would come in later. This was agreed.

The Chairman then informed the Committee that the draft convention for the regulation of the catch of whales outside the territorial waters, which had been prepared by the French Interministerial Committee and brought to the notice of the Committee at Paris, had been appended as Appendices Nos. 1 and 2. Other papers, such as forms etc. which had been circulated at the meeting at Paris, would be kept on file at the office at Copenhagen.

Point 3 of the Agenda: Memorandum by Mr. BORLEY and other information from the members of the Committee.

The President informed the Committee that Mr. BORLEY had prepared this memorandum. As it was signed by the writer, the Committee was not responsible for it, and he assumed therefore that there need be no discussion.

On the proposal of the Chairman it was recommended that this statement be appended to the Procès-Verbal as Appendix Nr. 3.

Point 2 of the Agenda: Revision of a draft short report and programme of these meetings for the Procès-Verbaux of the Council.

The Chairman said that he had prepared with Mr. BORLEY'S assistance a shorter report of the meeting. Copies of this report not being available for circulation, the report was read and accepted.

On the proposal of the Chairman it was recommended that this report and the statement appended to the Procès-Verbal as Appendix Nr. 3 should be incorporated in the combined programmes of the Procès-Verbaux of the Council.

Point 4 of the Agenda: Election of Chairman.

Professor HJORT was re-elected Chairman for the ensuing year.

The Chairman expressed his thanks to the Committee for the pleasant co-operation of the past year, and hoped that this would continue during the next year, and specially that he would be able to be kept in touch with Spanish and Portuguese work through correspondence and exchange of samples. This was heartily agreed by the Spanish and Portuguese members.

Point 5 of the Agenda: Other business.

Mr. BORLEY showed statistical forms used by the British Museum. On the proposal of Prof. SCHMIDT it was agreed that a specimen form as used by Denmark should be printed as an appendix in the Procès-Verbal.

Le Dr. Ramalho suggère que le travail soit considéré comme fait sans la coopération du Portugal, dont la contribution sera apportée plus tard. Adopté.

Le Président fait connaître au Comité que le projet de convention pour le règlement de la capture des baleines en dehors des eaux territoriales, qui a été préparé par la Commission française interministérielle, et porté à la connaissance du Comité à Paris, a été annexé sous la forme des Appendices 1 et 2. D'autres pièces, telles que des formules, etc, qui ont été distribuées à la réunion de Paris, seront conservées en dossier au bureau de Copenhague.

Point 3 des Agenda: Memorandum de Mr. Borley, et autres informations de la part de membres du Comité.

Le Président fait savoir au Comité que Mr. Borley a préparé son memorandum. Celui-ci étant signé par l'auteur, le Comité n'y a pas de responsabilité et il semble donc qu'une discussion n'est pas nécessaire.

Sur la proposition du Président, il est recommandé que cette déclaration soit annexée au procès-verbal comme Appendice No. 3.

Point 2 des Agenda: Révision d'un projet de court rapport et programme des réunions, pour les Procès-Verbaux du Conseil.

Le Président dit qu'il a préparé, avec l'assistance de Mr. Borley, un rapport plus court de la réunion. Les exemplaires de ce rapport n'étant pas prêts à être distribués, le rapport est lu et adopté.

Sur la proposition du Président, il est recommandé que ce rapport, avec la déclaration annexée au procès-verbal comme Appendice No. 3, soit inclus dans le programme combiné du Procès-Verbaux du Conseil.

Point 4 des Agenda: Election du Président.

Le Prof. Hjort est réélu Président pour l'année suivante.

Le Président exprime ses remerciements au Comité pour son agréable coopération de l'année passée et l'espoir que cette coopération lui sera continuée pendant l'année prochaine, et spécialement qu'il pourra se tenir en contact avec le travail de l'Espagne et du Portugal, par correspondance et par échange d'échantillons. Ceci est accepté de grand cœur par les membres Espagnols et Portugais.

Point 5 des Agenda: Autres affaires.

Mr. Borley montre les formules statistiques employées par le British Museum. Sur la proposition du Prof. Schmidt, on décide qu'un spécimen des formules employées par le Danemark soit imprimé en appendice dans le procès-verbal.

REPORT

of

ADMINISTRATION 1926—1927.

I. General.

Composition of the International Council for the Exploration of the Sea.

Germany rejoined the Council in the year 1926 on the same terms as the other Great Powers. Esthonia, since 1923 a free member, has withdrawn from the Council.

The German Delegates are Dr. C. Heinrici and Prof. W. Mielck. Portugal has appointed as new Delegates: — Rear Admiral Augusto Ramos da Costa and Dr. Alfredo Sobral Mendes de Magalhaes Ramalho. The Delegates appointed by the Government of Holland are Dr. J. J. Tesch and Mr. P. M. van Riel.

The Council has suffered a double bereavement by the deaths of the former Belgian Delegate, M. A. Hamman and of their General Secretary, the Danish Delegate, Captain C. F. Drechsel. As new Danish Delegate Prof. Johs. Schmidt has been appointed.

Composition of the Bureau.

The members of the Bureau were the same as in the preceding year: Mr. H. G. Maurice, President, Professor Johan Hjort, Professor Otto Pettersson and M. Théodore Tissier, Vice-presidents and Captain C. F. Drechsel, until his death on March 2nd, 1927, General Secretary.

Committees.

The following Committees have worked during the year: — Atlantic Slope Committee, North Western Area Committee, North Eastern Area Committee, Combined North Sea Committee, Northern North Sea Committee, Southern North Sea Committee, Baltic Area Committee, Transition Area Committee, Statistical Committee, Hydrographical Committee, Plankton Committee, Limnological Committee, Consultative Committee, Moray Firth Committee, Whaling Committee and Limnological Sub-Committee (Salmon).

Short reports prepared by the Chairmen of Area Committees covering the period between their last reports and the end of the calendar year, are incorporated in this Administrative Report under the title: Additional Report of the Area Committees for the Calendar year, 1926.

Audit of Accounts.

The Accounts of the Council for 1925—26, audited by a qualified accountant and examined and found correct by the Finance Committee, will be submitted to the Council for final approval.

A Statement is given on p. 104 of the Accounts from July 22nd 1926 to March 31st 1927. (As it has been decided that the annual meetings of the Council shall be held in the Spring or early Summer, it is considered desirable to balance the Accounts to March 31st.)

Meetings.

Meetings of the Bureau were held in Copenhagen in September 1926 and in Paris in March 1927. There were present in Copenhagen all members of the Bureau, in Paris Mr. Maurice, President, and Vice-presidents Tissier and Hjort.

A meeting of the Limnological Sub-Committee (Salmon) was held in Santander from the 5th to the 11th December 1926. There were present: Professor Louis Roule and Dr. Fernando de Buen, and as Spanish Experts: Mr. Enrique G. Camino y Bolivar and Dr. Alfonso Gandolfi, Professeur-agrégé à l'Institut espagnol d'Océanographie. A report of this meeting has been distributed from the Bureau to the Delegates and to the members of the Limnological Committee.

Meetings of the Moray Firth Committee were held in Ostend on the 4th and 5th of April. There were present: Prof. Johan Hjort, Dr. A. Bowman, Prof. E. Ehrenbaum, Prof. G. Gilson, Dr. E. S. Russell, Prof. Johs. Schmidt, Dr. J. J. Tesch and M. Léon Verbrugghe, and as Secretary to the Committee Mr. H. J. Crowe.

Meetings of the Whaling Committee were held in Paris on the 7th—9th of April. There were present: Prof. Johan Hjort, Dr. Ed. le Danois, Prof. Johs. Schmidt, M. David T. Jones, Dr. A. Bowman, Prof. Odón de Buen, Dr. Fernando de Buen and Mr. J. O. Borley. Besides, there were present Messrs. Pillault, Gruvel, Pillias, Lecourbe, and Ct. Pavie of the French Interministerial Committee.

The Report of the Moray Firth Committee has been circulated to all Delegates and to the Members of the Moray Firth and of the Consultative Committees. The Protocol of the Whaling Committee has been circulated to the Members of the Committee.

Five yearly period of adhesion to the Council.

All participating countries have now agreed to participate for five years from July 21st 1926.

Statement of Accounts for the period from July 22nd 1926 to March 31st 1927.

Receipts:

			Estimates for the whole year	Real Receipts
I.	1.	Balance brought forward from 1925/26	177 687.17	177 687.17
II.	2—16.	Annual contributions of the Governments	157 000.00	90 000.00
III.	17.	Interest from the Bank	4 000.00	2 006.32
IV.	18.	Sales of publications	400.00	0.00
		Total Kr.	339 086.17	269 693.49

Expenditures:

			Estimates for the whole year	Real Expenditures
I.	1—6.	Incidental expenses	31 000.00	18 999.99
II.	7—10.	Assistance etc.	32 250.00	21 994.44
III.	11.	Expenses of the office in Copenhagen	15 000.00	12 029.23
IV.	12.	Travelling expenses	13 000.00	2 820.37
V.	13.	Chairmen of Committees	24 000.00	12 000.00
VI.	14.	Special Resolutions of the Council	7 500.00	920.59
VII.	15.	Printing and distribution	40 000.00	5 634.62
		Total Kr.	162 750.00	74 399.24

Receipts	per 31/3 1927	Kr. 269 693.49[1])
Expenditures	per 31/3 1927	- 74 399.24
Cash balance	per 31/3 1927	**Kr. 195 294.25**

Of this Balance were deposited in Kjøbenhavns Handelsbank, Hellerup Afd. and cash ..... Kr. 146 225.23

Danish Treasury Bills, nominel Kr. 51.600,00, deposited in a box in the bank. (Market value on March 31st Kr. 51 213.00) Purchase value ..... » 49 069.02

Kr. 195 294.25

The following countries have not paid their contributions before the 31st March: Belgium, Great Britain, Finland, France, the Netherlands, Portugal and Latvia.

Special reserve for pensions, deposited on a special account in the bank: Kr. 3 933.64.

[1]) + Russia's contribution for 1914/15, **Rbl. 14 430.54,** deposited in a Leningrad bank has not yet been recovered.

II. Work of the Bureau at Copenhagen.

The Bureau decided at their meeting held in Paris on the 29th of March that — pending such arrangement as the Council would see fit to make at its meeting in May — the direction of the staff and offices at Copenhagen should be entrusted to Captain Schøning.

Besides administrative work, correspondence, etc. the following work has been carried out: —

A. Publications.

Report regarding the publications issued and cost of same during the financial year 1926—27 per $^{31}/_{3}$ 1927.

VII. — 15. Printing.

Journal du Conseil, Vol. I, No. 4	(Including honoraries to authors, translations, clichées etc.) 750 copies	Kr.	1 927.52
— - — — II, - 1	Translations and Clichées	-	207.50
— - — — I, - 3	Bibliography	-	99.05
— - — — II, - 2	Translations	-	75.00
Bulletin Trimestriel, 1926, No. 3	.....	-	720.33
— — 1926, - 4	.....	-	543.07
Distribution of Publications	.....	-	898.10
Unforeseen expenses: drawings, translations etc.	.....	-	1 164.05
Paid per $^{31}/_{3}$ 1927	.....	Kr.	5 634.62

B. Other work of the Bureau.

Report of work carried out by the Departments of the Bureau during 1926—27.

a. Hydrographical Department.

Publications of or edited by the Service Hydrographique:

I. Bulletins and reports.

a. The following bulletins and reports mentioned in the Procès-Verbaux XLI p. 105, Hydrographical Department, (A) have appeared and were distributed 1st September:

Bulletin Hydrographique pour l'année 1926.

Bulletin Hydrographique, Appendice Supplémentaire d'Observations de Surface Anglaises pour la période 1915—1923. Appendice I—II pour les années 1923 et 1924.

Rapport Atlantique 1925 par Dr. le Danois (as Procès-Verbaux XL).

b. Material for the ordinary Bulletin Hydrographique received from Denmark, Finland, Germany, Great Britain, Holland, Norway and Sweden (Belgium reporting no material for 1926 available), has been edited and was sent in for printing on 30th March, in order that the volume for 1926 might be ready before the Council's meeting in Stockholm in May.

c. According to the resolution of the Editorial Committee, an appendix to the Bulletin Hydrographique of 1926: Appendice d'Observations de l'Allemagne pour 1919—1925 et de la Lettonie pour 1925 et 1926, will appear contemporaneously with the Bulletin Hydrographique.

d. The Rapport Atlantique for 1926 is still under preparation for printing. The manuscript, however, not having arrived till the 13th March, can be ready for the Council's meeting only in draft.

e. The Service Hydrographique further has supervised the printing of Vol. XLII of the Rapports et Procès-Verbaux, which was distributed together with the Bulletin Statistique in April.

f. The first part of the Report of Professor Hjort on his Greenland expedition, viz. Copepods from the Michael Sars' Expedition 1924 by Leif Størmer was prepared for press by the Service Hydrographique, but at Dr. Hjort's suggestion, the Editorial Committee decided to postpone the publication of this paper until the whole Report could be sent out in one volume, which probably will be possible at the end of the present year.

g. Also the printing of a paper by Hjort and Ruud: A method for the analysis of plankton samples for the Journal of the Council has been attended to by the Service Hydrographique, the final proof and the blocks, by permission of the General Secretary being put at the disposition of Professor Hjort for contemporaneous publication in a Norwegian paper.

II. Bulletin trimestriel.

Nos. 3 & 4 for 1926 of the Bulletin trimestriel have appeared respectively on the 20th of November 1926 and the 19th February 1927. Number 1 of 1927 is under preparation and is expected to appear about 20th May.

A Pro Memoriam from the Service Hydrographique on the form and contents of the Bulletin trimestriel together with a scheme for the tables was sent out the 2nd May with circulars of the Bureau.

III. When time has permitted, statistical work on the basis of the pre-war Bulletin Hydrographique on $t°$ and $S‰$ in the North Sea has been carried on, the

question of a direct relation between the hydrography of the North Sea and the relative catches of trawlers (according to Edser) has been studied.

b. Statistical Department.

The Bulletin Statistique for the year 1923 was distributed in August 1926. That for 1924 was distributed in the middle of April of this year. Work on the Bulletin for the year 1925, is well advanced, but the material from Finland, France and Portugal has not yet been received by the Bureau.

Additional Reports of the Area Committees

for

the Calendar Year 1926.

At the meeting of the International Council in Copenhagen in 1926 it was decided that the Area reports should relate to the investigations made during the calendar year, and should be presented to a meeting of the Council in the following spring[1]). As the last reports presented to the meeting of the Council were prepared for the period of the financial year 22nd of July 1925—21st July 1926, it was further decided that the chairmen of Committees should prepare short reports concerning the period between their last reports and the end of the calendar year 1926. Such additional reports are given below.

NORTH EASTERN AREA

July—December 1926.

By

JOHAN HJORT.

Biological Statistics. In the previous report for the financial year 1925—1926 reviews were given of the distribution of year-classes in the stock of herring and cod in the catches of the Norwegian spring fisheries 1926.

An article summarizing the situation as regards the stock of cod in the Finmarken fishery has now been sent to the Journal of the Council. The year-classes 1917 and 1919 played the most important part in the catches of the fishermen off the coast of Finmarken, as they also did earlier in the year in the skrei fisheries. Along the whole coast the very great number of small individuals belonging to the year-class 1919 — spawning for the first time — was very marked. It will be interesting this spring (1927) and in the next years to follow the influence of this year-class on the catches.

In connection with this work, the recommendation of the Committee at its last meeting viz: to compare the stock of cod off the coast of Finmarken with

[1]) See: Rapp. et Proc. Verb. Vol. XLI, p. 38, Rec. No 2.

the stock off the mouth of the White Sea, has been attended to. Through the courtesy of Messrs. Pickering Haldane and Co. of Hull, and with the kind assistance of Mr. J. O. Borley, facilities were provided for sending a Norwegian observer on board an English trawler to the White Sea.

A communication from Mr. Oscar Sund informs me of the main and important result of this voyage, viz: that no younger cod were observed near Cape Kanin in numbers worth mentioning than those belonging to the 1919-group. The only difference between two percentage curves, the one from Cape Kanin, the other from the coast of Finmarken, is that the fish were about 4 or 5 cm. bigger in December (Cape Kanin) than in the spring (Finmarken). This result gives further evidence in support of the general belief, that the cod in both cases belong to a common stock.

Hydrographical and biological investigations of the Norwegian coastal waters were continued according to the plan described in the committee's last report. Off the coast of Møre, 8 cruises in all were made during the year, with the object of studying the changes of the water layers and the plankton contents of the water during the different seasons of the year. The very large amount of material collected was studied during the autumn of that year. A method for the comparison of the catches from different stations and periods of the year has been studied and described in a short article by Mr. Johan T. Ruud and myself in the Journal of the Council[1]). The results of the work seem to promise an understanding of the life history of the most important plankton animals and the fluctuations in their quantities. The material seems to indicate some connection between the maximum development of the plankton animals, and the seasonal appearance of some species of fish and whales.

During the autumn, extensive preparations were made for a continuation of the investigations of the waters off Møre, and in the Lofoten district during the present year; two minor expeditions are now carrying out this work.

The m/s "Morild" (Mr. J. T. Ruud) is working with the whaling station on the island of Aukra as a base. The m/s "Johan Hjort" (Mr. Oscar Sund) is carrying out the investigations in the West Fjord. The plan is for both expeditions to repeat as nearly as possible the work of 1926, in the hope of arriving at a comparison between the two years.

Investigations of the stock of "Brisling", or immature sprat, have now been carried out for a long series of years, recently by Mr. P. Bjerkan, who has also published some articles on the subject. The investigations are partly of the nature of biological statistics, in so far as they describe the composition of

[1]) Journal du Conseil, Vol. II, No. 1, p. 28-38.

the stock with regard to size and age. As is well known, the sprat spawns in the Skagerak and in the Southern North Sea, and the young are seminated along the whole of the Norwegian coast as they drift from the Skagerak to the North West coast of Norway. Mr. Bjerkan has described this drift, and demonstrated the immigration, growth and final distribution of the individuals of the age below the first year. The results of this work seem to indicate considerable fluctuations in the production of the different years, and there seems to be an interesting correspondence in this respect between the stock of the Norwegian waters and that found off the coasts of the Southern North Sea.

The fluctuations in the fisheries of the young Brisling seem, however, not to be entirely dependent on the stock present. The young fish, being plankton eaters, are mainly distributed in the water layer containing the greatest amount of Copepods. Mr. Bjerkan has therefore, during the year 1926, carried out a series of investigations of the hydrography, the vertical quantitative distribution of the plankton, and the young sprat in a number of Norwegian fjords, which throws much light on the life history of Brisling and the conditions of the Brisling fisheries, which are of great importance to the canning industry of the South western coast of Norway.

Mr. Bjerkan is preparing an article for the journal on this work.

The Arcto-Norwegian stock of plaice has attained a highly increasing importance. New fisheries have been developed which yield over 2000 tons a year. They call for scientific investigations of an international character. The work done so far in Norway is merely to be considered as preliminary. In 1924 and 1925, Mr. Bjerkan marked a number of large plaice. More than 23 per cent. of the marked fish have been recovered. It seems very desirable that this work should be taken up by international co-operation.

Finland.

Biology:

1) The treatment of the material which in the summer of 1925 was collected on the coast of the Barents Sea at Petsamo is going on.
2) In the summer of 1926 investigations of the vegetation of marine algae on the Finnish coast at Barents Sea have been made, and the results are under treatment.

NORTH WESTERN AREA

October—December 1926.

By

Professor Johs. Schmidt.

At the meeting in Copenhagen in September 1926 the Chairman of the Committee presented a report for the portion of the year up to that date. Since it was decided at the meeting that the working year of the Committee should in future from the beginning of 1927 coincide with the calendar year, a survey of the work carried out in the last three months of 1926 is herewith presented. The Research Vessels from the participating countries had by September concluded the year's cruises in the area in which the work of the Committee is carried out.

England. No special work was allotted to the last three months of the year.

France. Ditto.

Norway. Ditto.

Scotland. Age determination of haddock from Iceland and the Faroe Islands.

A very extensive collection of haddock data has been made from Iceland consisting of copious scale samples and measurements collected by the "Dana" for several years and also by the "Explorer" in 1925. In addition numerous representative samples have been collected from catches landed in the Aberdeen market. From this material it has now been possible to analyse the statistical data into the constituent age groups and to study each of the broods from 1920 to 1926 with respect to numerical strength and the movement of centres of density.

Iceland and other areas of importance to the haddock fisheries have been found to vary independently of the North Sea with respect to the exact incidence of productive and non-productive brood years, as well as in other biological details, such as time of first maturity, growth rate etc.

The first report on the material by Dr. H. Thompson is now practically complete and will be published at an early date.

Age determination of lemon sole from the same area (1926).

Collection of plaice material for racial investigations.

Denmark. A series of hydrographical observations off the Faroe Islands has been taken in the last months of the year by the Danish Inspection Vessel.

A communication to the effect that some 350 cod had been marked in the course of the summer off Greenland on the stretch between Holstensborg and Fiskernæsset was not received until after the Council meeting in September.

The marking of cod off the Faroe Islands was by force of circumstances postponed to March 1927.

Examination of plaice from the cruise in the summer of 1926 and of material from the same area from the preceding years (see below).

Age determination etc. of cod from Iceland 1926.

Working up of pelagic material from the summer cruise (see "Journal du Conseil" Vol. II, p. 38: Eel Larvae in the Faroe Channel).

Working up of material from bottom valuation experiments off the Faroe Islands and Iceland (by Dr. phil. R. Spärck).

As regards the working up of data relative to plaice from Iceland the following points may be mentioned:—

The investigations concerning the age composition of the plaice stock off Iceland are based on a determination of the number of rings in about 4200 otoliths from the years 1925—26 (for 1924 a determination has been made from some 3200 otoliths).

In Faxe Bay (West Iceland), both in territorial and extra-territorial waters, the density of plaice in 1926 was less than in the preceding years (see Adm. Report for 1925—26 p. 148—149). Age analyses showed that the 1920 brood, which in 1925 had been very predominant (constituting about 46 per cent. of the catch) was once again predominant in 1926 (constituting about 42 per cent. of the catch).

In Skjàlfandi Bay (North Iceland) the density of plaice in 1926 was less than in the preceding years (see Adm. Report for 1925—26 p. 149). The 1918 brood was predominant throughout these three years at depths from 19 to 50 metres; in 1924 this was also the case in shallower water (depths of 7 to 15 metres), but in 1925 the 1918 brood was surpassed numerically in shallower water by the 1920 brood (i.e. the same brood which in 1925—26 was predominant in Faxe Bay). The plaice usually remain in the bay until they are 8 years old whereupon they leave it.

The material from South Iceland for 1925 ("Explorer") shows the complete predominance of III-Group. (The 1922 brood constituted nearly 80 per cent. of the catch.) A series of samples taken at depths of from 24 to 45 metres show moreover a very pronounced decrease in growth from West to East.

	Vestmanø Area	Ingolfshøfdi	Hornene
Average length of III-Group	30.75 cm.	23.88 cm.	20.78 cm.

When regarding this decrease we must take into consideration the hydrographical conditions prevailing off South Iceland, where as is known a great fall in temperature is met with upon going from West to East; possibly the intensity of fishing along the south coast has also some effect, as has also the fact, which we may regard as probable, that the waters towards the West are particularly rich in nourishment in that the great spring fishing brings the lower animals enormous quantities of fish offal as food.

In order that the age may be determined at which the Icelandic plaice for the first time reaches maturity, some material has been provided by the English and Scottish fishing investigations (through the agency of Mr. J. O. Borley and Dr. Alex. Bowman) and also by the Adviser to the Fisheries of Iceland, Mr. Bj. Sæmundsson.

In the South of Iceland (Medalland Bay) a number of plaice are still unripe in their fourth year, but from the beginning of their fifth year the majority no doubt reach maturity; the majority of the females are, upon reaching maturity, over 37 cm. in length, and the majority of the males over 35 cm. In the West of Iceland the age at which first maturity is reached is evidently 2—3 years later, but both as regards this area and South Iceland there is not sufficient material to hand to enable a more detailed explanation to be given on this subject.

An investigation has also been carried out to determine the time when the 0-Group of the plaice seeks the bottom. For this purpose material is used dating back to 1903. The result is as follows: the earliest time the 0-Group is captured at the bottom stage occurs round Iceland at the following periods:—

South-west Iceland.....	in the last third of June.
North-west Iceland.....	in the first third of July.
North Iceland.....	in the middle third of July.
East Iceland	in the middle third of September.

This is in agreement with the anti-cyclonic drifting of fish eggs and fish fry of other species (cod, haddock etc.) which is found to take place off South-west and North Iceland according to the hydrographical conditions.

PLATEAU CONTINENTAL ATLANTIQUE

Juillet—Decembre 1926.

(Atlantic Slope.)

Par

Ed. le Danois.

Ce Comité a marqué pendant l'année écoulée des signes de développement qui sont la conséquence de l'heureuse prospérité du Conseil International.

Nous avons en effet l'honneur de compter parmi les nations qui apportent leur collaboration aux travaux de ce Comité, un nouveau pays qui désire participer activement à nos recherches. A la suite d'une correspondance récente, M. le Dr. Heinrici, Secrétaire d'Etat des Pêcheries d'Allemagne, a bien voulu m'informer que le Reich désignait un délégué au Comité du Plateau Continental Atlantique et c'est avec grande satisfaction que j'ai appris que ce délégué n'était autre que le Dr. Schott dont les travaux sur l'Océan Atlantique le qualifient comme un technicien indiscuté.

Un autre évènement heureux pour notre Comité est que le Conseil a bien voulu reconnaître l'importance de ses efforts en nommant, pour me seconder, en qualité de vice-président du Comité, mon collègue et ami, le Professeur Rafael de Buen. Je suis assuré que sa collaboration apportera dans l'avenir des résultats de plus en plus fructueux pour nos études et nos recherches.

D'un commun accord, nous avons préféré conserver dans toute son intégrité la vaste étendue du secteur du Comité du Plateau Continental Atlantique. Nous sommes, en effet, persuadés que pour étudier l'ensemble d'un phénomène, il faut garder les mêmes méthodes et les mêmes interprétations et que ce soient les mêmes hommes qui le discutent depuis son origine jusqu'à ses conséquences ultimes. Toute fragmentation poussée à l'extrême amène à réduire les problèmes scientifiques à un morcellement néfaste et stérile.

Le programme du Comité du Plateau Continental Atlantique n'a guère varié depuis la création du Comité; il a été précisé d'une façon définitive dans une réunion tenue à Paris le 7 Janvier 1925 et dont le compte-rendu figure dans le Rapport Atlantique 1924; il me paraît donc inutile de le reproduire à nouveau.

Les résultats de ce programme d'études ont été suffisamment fructueux pour qu'aucune modification fondamentale ne s'impose actuellement en ce qui concerne ses grandes lignes. Je peux seulement regretter que soit le mauvais temps, soit des conditions matérielles, aient empêché sa réalisation complète pendant l'année qui vient de s'écouler.

1926	Angleterre	Irlande	France	Espagne	Portugal
Janvier	....	....	....	....	....
Février	Salpa	Muirchu	....	....	....
Mars	Salpa	....	Engageante	....	Albacora
Avril	Salpa	....	....	....	....
Mai	Salpa	....	Engageante Hebe Estafette	Proserpina	....
Juin	Salpa	....	Hebe Pourquoi-Pas?	....	Albacora
Juillet	Salpa	....	Tanche Pourquoi-Pas?	....	Albacora
Août	Salpa	Muirchu	Engageante Tanche Pourquoi-Pas?	Proserpina	....
Septembre	Salpa	....	Tanche	....	....
Octobre	Salpa	....	....	....	....
Novembre	Salpa	....	Vaillante	....	....
Décembre	Salpa	....	....	....	....

Ce programme comprend, en effet, notamment, quatre sorties annuelles combinées et effectuées par des navires des gouvernements espagnols, français et irlandais; or, les Espagnols et les Irlandais ont dû limiter à deux sorties l'exécution du dit programme. Cette lacune a été préjudiciable aux recherches générales entreprises par le Comité.

Nous avons à déplorer d'autre part que les deuils profonds qui ont frappé la délégation portugaise par les disparitions successives de nos deux regrettés collègues, l'Amiral Neuparth et le Colonel Chaves, ont paralysé partiellement les remarquables efforts de notre ami le Dr. Ramalho. Il a pu cependant, dans le courant de l'année 1926, effectuer deux sorties avec son nouveau navire "Albacora". Quoi qu'il en soit, les travaux du Comité ont permis d'arriver à assurer une heureuse continuation des recherches antérieures.

Je publie, voir p. 115, un petit tableau indiquant par mois et par pays les sorties effectuées par les navires de recherches, dans le secteur du Plateau Continental Atlantique.

Il peut se résumer comme suit:

Angleterre:	Sorties périodiques mensuelles du navire "Salpa" de la M.B.A. — Ce navire assure les observations régulières en Manche occidentale.
Irlande:	Sorties du navire "Muirchu", en Février et Août.
France:	Sorties périodiques des canonnières de la Marine Nationale, en Mars, Mai, Août et Novembre.
	Croisière du navire "Estafette" de la Marine Nationale, en Mai.
	Croisière du thonnier "Hebe" en Mai et Juin.
	Croisière du navire "Tanche" de Juillet à Septembre.
	Croisière du navire "Pourquoi-Pas?" de Juin à Août.
Espagne:	Sorties du navire "Proserpina" en Mai et Août.
Portugal:	Sorties du navire "Albacora" en Mars et en Juin-Juillet.

Le rapport annuel, qui est le sixième de la série des Rapports Atlantiques, comporte les listes des stations hydrologiques effectuées par ces différents navires. Ces stations ont fait l'objet de remarques hydrologiques sur les principaux phénomènes qui ont marqué l'année 1926 et dont l'interprétation a été redigée par Rafael de Buen pour le secteur sud, et par moi-même pour le secteur nord.

A la suite de cette partie hydrologique figurent des remarques de biologie générale, qui sont la conséquence des croisières précitées.

Je pense que cet ensemble de travaux justifiera, aux yeux du Conseil International, les encouragements qu'il a donnés à notre Comité depuis son origine.

COMBINED NORTH SEA COMMITTEE

September to December, 1926.

By

David T. Jones.

During the short period covered by this Report since the meeting of 3rd September last it has not been found necessary to convene a further joint meeting of the Northern and Southern North Sea Committees but contact between the two Committees has been maintained and information has been exchanged with a view to the prevention of overlapping and to assisting in the elucidation of problems common to the whole of the North Sea.

The work of the Committees which is described in the subjoined Reports was unfortunately curtailed by prolonged industrial trouble in the United Kingdom. The Report of the Northern North Sea Committee deals mainly with Scottish researches, France being the only other Country represented on the Committee from which a report has been received. This contribution is welcome as the first to hand from France.

It should be mentioned that in addition to the programme of work described in the Northern North Sea Report, the Scottish investigators have been actively engaged during the period in the preparation of the series of scientific papers which is appended to the Report of the Moray Firth Committee.

The Report of the Southern North Sea Committee is self-explanatory and needs no further comment.

NORTHERN NORTH SEA

By

A. Bowman.

General.

In the Report for 1926 a somewhat comprehensive survey of the work carried out in the area to the end of August 1926 is given. At the same time an outline of the programmes of work to be undertaken by the participating countries to

the end of 1927 is also included. The period which has to be covered by the present report is therefore a comparatively short one including the four months September to December 1926. These are the months in which Research Vessels are least actively engaged within the area. It is a period when investigations at sea are very liable to serious interruptions by adverse weather conditions. Unfortunately during this period the operations of the Scottish Research Vessel "Explorer", which as a rule is kept in continuous commission, were very seriously curtailed owing to the continuance of the coal strike and various expedients were adopted in the exceptional circumstances to maintain the continuity of the researches. It was possible, however, to carry out the following modified cruises:—

July—August: A survey of the summer herring fishing grounds from Aberdeen to Shetland and westwards to the Butt of Lewis and to the Minch. The prevailing hydrographic and plankton conditions. Sampling of the herring shoals by means of drift nets of various sizes of mesh.

September—October: Age distribution and frequency of occurrence of the haddock on the feeding grounds in the area north of the line Aberdeen—Bergen. Investigations on the food of the haddock. The distribution of the newly hatched broods of herrings in the north-western area.

October: Intensive investigations on the influx of the older post-larval herrings of the autumn brood into the Firth of Forth and adjacent areas. Plaice marking experiments on the East Coast of Scotland.

November: Trawling survey of the Moray Firth.

In accordance with the recommendations of the Committee special attention was devoted to the question of the metamorphosis of the autumn brood of post-larval herring and to the proportion of these carried over the winter months in the unscaled condition as this fact has an important bearing on the question of the correct age-determination of the adults.

It was also considered desirable by the Committee that investigations should be made during the spring months to ascertain the intensity of spawning of herring in the northern North Sea on the western side of the Norwegian Channel. It may therefore be noted here that the western edge of the Norwegian Deep received particular attention in the month of March and April of the present year with a view to supplement existing data and to confirm this region as one for spring spawning. Positive records of the occurrence of herring eggs from cod and haddock stomachs were again obtained in the neighbourhood of the Viking Bank so that, other data being considered, it must be assumed that spawning along the western edge of the Norwegian Deep is a normal occurrence and is not so erratic as has been supposed.

Haddock.

The study of all the data collected in recent years to December 1926 from the various regions of haddock distribution has now been completed and the results are being prepared for publication in detail. The collection of market statistics was carried on as formerly and the combined catches of Scottish and English vessels summarised in the monthly statistical charts have been used as the basis of this investigation. The measurements at sea of large numbers of unselected samples of the catches of commercial vessels have also been incorporated. Use of the scales of the fish collected at sea on the Research Vessel and on commercial vessels and from the market catches as a means of determining age and local characteristics forms the groundwork for the wider interpretation of the general commercial statistics. The available commercial statistical data have been analysed into their constituent age groups and each of the broods from 1920 –1926 studied both in respect to numerical strength and to the movements of centres of density. It is found that in the North Sea the 1923 brood was the most prolific in numbers since the opening of the present century and gave rise to unusual phenomena. The 1920 brood was also very successful, while in 1924, 1925 and 1926 broods were normal. Thus the temporary depressing effect of the unsuccessful 1921—22 broods upon the stock has been removed. In fact during 1926 the catches — especially of smaller and medium-sized haddock — rose to unusual proportions.

Alongside the comparative productivity of the broods there can now be placed that of the rate of their attrition in numbers from year to year, until finally they cease to be of importance to the fisheries. It has been found that up till the end of the second year the rate of diminution of numbers is not serious, as far as the possible methods of estimation show. Thereafter, however, with the assumption of the spawning habit the annual depletion appears to be nearly one-half of the numbers so that by the time the seventh year is reached even a prolific brood has ceased to be of commercial importance. It thus becomes clearer that modern haddock fishing is very largely dependent upon the replenishment of the sea with young fish and that the relative scarcity of large fish is for the most part the normal result of intensive fishing.

The study of the mass movements of the broods in the North Sea has established the fact that from the first northerly spawning migration onwards the gain is always to the north. Ultimately at the age of about 6 or 7 years the north-west Scottish area, including the Shetlands, harbours by far the greater proportion of the survivors of a brood. Here it is that the best and most consistent catches of large haddock are obtained.

As the methods for a thorough-going age-assessment of the haddock population of the North Sea have now been established, the scope of the researches on the haddock biology has been evidenced. The question of the food and feeding habits of the species which has hitherto only been attacked in a tentative manner

is now receiving systematic treatment. Material for this study was collected during the trawling cruises of the "Explorer" from special stations selected with relation to the varying types of growth of the haddock which have been shown to characterise these areas. The catches of haddock are sorted into 5 cm. groups and a number of stomachs (and their contents) are collected and preserved for examination in the laboratory. At the same time collections are made with the Petersen Bottom Sampler and with the Agassiz Trawl to ascertain the amount of food available on the different grounds. The contents of each stomach is not examined separately but all the stomach contents of each size group are combined and the total volume ascertained, the number of empty stomachs being noted at the same time. The various species in the total volume are then separated out, the relative volumes (or the numbers) of each etc. and the amount of unidentifiable residue noted. In this way a fair estimate of the relative importance of each type of food is readily obtained and a much more comprehensive survey can be carried out than by an examination of individual stomach contents.

The systematic examination of such collections of haddock stomachs should yield results which will enable us to state definitely what species are most important as food at different seasons of the year, what differences there are on the different grounds, whether haddocks belonging to different size groups consume the same kinds of food and what are the relative volumes. It is hoped that the collection of such data will throw further light on the question of the different growth rates of haddock on the different grounds. The immediate object of the study, however, is to ascertain whether there are definite changes in the food of the haddock with increasing size or whether all sizes compete for the same food and what quantity of food is taken at each size. Such data when correlated with the data of growth rates have a very practical bearing on the question of the rational exploitation of the haddock stock.

Herring.

Although the plankton investigations by the Research Steamer "Explorer" were greatly curtailed as a result of the economic conditions the continuity of the investigations on the distribution and frequency of occurrence of larval and post larval herring was maintained as far as conditions would permit.

During the temporary idleness of the "Explorer" investigations were made with a fine-meshed seine net at the mouth of the River Dee, Aberdeen, and in the neighbouring bays in June and July, and a large catch of metamorphosing stages of herring ranging in size from 29 to 57 mm. with a mean size of 42 mm. was made on June 21st. From an examination of their morphological features and from their size and date of occurrence these fish have been taken to belong to a late incidence of spawning of the autumn herring. From a comparison of the results obtained in other years these autumn brood post-larvae appear to be unusually late and

this may bear some relation to the abnormal conditions at the end of 1925 when spawning herring were obtained off the Aberdeenshire coast as late as December.

A collection of clupeoids from the "Dana" investigations in May 1926 was examined. These were taken with a 2-metre stramin tow-net during a cruise from the Skagerak to the Orkneys. Herring post larvae were secured only in the immediate neighbourhood of the Naze and of the Orkneys. None was taken at intermediate positions across the North Sea.

Hatching of the autumn brood began early in August in the East Minch area near Cape Wrath and about the middle of the same month East of Orkney. Newly-hatched larvae were taken in September immediately south of the Moray Firth grounds.

In accordance with the recommendation of the Committee special attention has been given to the metamorphosing stages of the spring and autumn broods. Metamorphosis of the spring brood begins at a smaller size than in the autumn brood. The change to the adolescent stage shows that first as an increase in depth and width and a corresponding decrease in length. Scale pockets are laid down posteriorly and extend gradually forwards along the lower half of the body towards the operculum. The dorsal half of the body in front of the dorsal fins appears to be the last to be scaled. Delicate scales are developed within the pockets and their size increases with the growth of the fish. As metamorphosis proceeds the keeled scales (K_1) from the throat to the pelvic fins next appear. Metamorphosis is completed with the growth of the keeled scales (K_2) between the pelvic fins and the anus.

In the spring herring of the East Coast of Scotland scale pockets begin in fish of 35 mm., and the keeled scales (K_1) about 42 mm. In the autumn brood the former appear about 40 mm. and the latter about 47 mm. Fully metamorphosed stages of the spring herring of the Scottish East Coast have been taken at 47 mm. and of the autumn brood about 60 mm.

The spring herring may be fully scaled by the end of July but adolescent stages continue to appear so far as investigations show till October. Our knowledge of the first appearance of the fully scaled autumn brood is still indefinite. Post-larvae of autumn origin are carried over the winter months still in the unscaled stage and it is possible that the majority of this brood is not fully scaled until June or July of the succeeding year.

The investigations on the scaled stages on the Scottish East and North East Coasts have been devoted chiefly to the distribution of the younger immature herring groups and from the mass of records available it appears tolerably certain that the 0 and I Groups in the north western area are confined to the immediate neighbourhood of the coast, concentrations occurring within the shallower parts of the Moray Firth. While concentrations also occur on the East Coast of Scotland

in the region of the Tay and Forth Estuaries there is also apparent here an open-sea distribution extending as far eastwards as the "Gut" with undefined limits to the south.

Cod.

On the trawling cruises of the Research Vessel a total of 285 cod were marked and liberated for the Ministry of Agriculture and Fisheriès (England).

Plaice and Lemon Sole.

The number of plaice and lemon sole marked throughout the period was 1215 and 573 and the recaptured fish totalled 721 and 140 respectively. The marking experiments on plaice were confined mainly to small fish.

Sprat.

Sprats have been very poorly represented in the catches and only a few small samples have been collected.

Hydrography.

As in previous years, data pertaining to the physical characteristics of the northern North Sea and the waters adjacent thereto in the north and north west were systematically collected during the fishery investigations. The data were submitted in the prescribed tabular form for publication in "Bulletin Hydrographique Trimestriel".

The data already available from earlier drift bottle experiments were further augmented by the liberation of surface and bottom drift bottles in the Minch and off the West Coast of Scotland as well as in certain regions of the North Sea.

Plankton.

Extensive plankton collections were made on all the periodic fishery cruises.

As an integral part of the scheme of herring investigations the examination of the stomachs of young herrings for food contents has been carried out. A report is now in the press embodying the results of investigations on collections from various parts of the Scottish East Coast.

An intensive study of the life-history of *Calanus finmarchicus* within the north western area has been initiated. For this purpose the extensive plankton collections made throughout the whole of the year 1920 are being utilised.

Contribution de la France aux travaux de recherches du Comité de la Mer du Nord (partie Nord).

L'aviso "Quentin Roosevelt", les garde-pêches "Estafette" et "Sentinelle" ont étendu leurs observations, au cours de l'année 1926, dans le Secteur Nord de la Mer du Nord: le "Quentin Roosevelt" au cours de sa croisière annuelle (Juillet—Août), la "Sentinelle" et "l'Estafette" pendant la campagne de pêche du Hareng aux filets dérivants (Juillet à Octobre).

Les observations faites ont été les suivantes:—

Pêche de plancton, particulièrement sur les pêcheries harenguières.

Prises de températures, en surface et sur le fond.

Observations météorologiques sur les lieux de pêche.

Les fluctuations de la pêcherie sur les divers fonds de pêche ont été relevées, et, à Boulogne, divers prélèvements faits sur les drifters ont permis l'étude biométrique de plusieurs lots de harengs du Nord de la Mer du Nord.

Les observations françaises ont donc à peu près exclusivement porté sur l'étude de la biologie du hareng et des conditions de pêche de ce poisson. L'attention a été également attirée par la présence abondante de thons rouges en Mer du Nord, surtout sur les pêcheries de harengs. Un travail particulier sur "La présence du Thon Rouge en Mer du Nord et dans l'Atlantique Nord-Est" fera l'objet d'une communication spéciale.

La participation de la France aux travaux de recherches du Comité du Nord de la Mer du Nord va pouvoir devenir, désormais, plus importante grâce aux nouvelles directives prises par les chalutiers boulonnais. Ces chalutiers envisagent le retour sur les fonds de pêche de la Mer du Nord. Il deviendra dès lors possible d'étendre les investigations du Laboratoire de Boulogne aux espèces rapportées par les chalutiers: Merlus, Morues, Haddocks, Poissons plats etc., et suivant le programme déjà indiqué par le Conseil International: prélèvement d'échantillons, mensurations, lecture d'écaille. Etat physiologique et nourriture du poisson.

Boulogne sur Mer, le 8 Mai, 1927.

J. LE GALL.

Projet de Travaux en Mer du Nord (partie Nord).

I) Croisières annuelles des Avisos "Quentin Roosevelt" et "Ville d'Ys".
Campagnes de pêche de "l'Estafette" et de la "Sentinelle".
Observations météorologiques, hydrologiques.
Pêche de planctons.

Observations diverses (suivant un programme établi) sur les pêcheries de harengs (et de thons rouges).
Prélèvements d'échantillons. Recherche des "Spawning Grounds".

II) Observations et recherches au Laboratoire de Boulogne-sur-Mer.
Prélèvement d'échantillons à bord des chalutiers fréquentant la partie Nord de la Mer du Nord.
Etude des fonds de chalutage fréquentés et statistiques de pêche.
Etude biométrique et biologique des poissons recueillis.
Prélèvements et lectures d'écailles des: Morues, Haddocks, Merlans, Poissons plats, Merlus.
Etude particulière de la biologie du Thon Rouge de la Mer du Nord et des conditions hydrobiologiques de sa présence dans certaines régions de la Mer du Nord.

Boulogne sur Mer, le 7 Mai, 1927.

Jean le Gall.

SOUTHERN NORTH SEA

By

J. O. Borley.

Preliminary.

The period covered by this report is half that with which the corresponding reports on other occasions have dealt, and moreover the coal strike in England interfered seriously with the conduct of sea work by that country and by Scotland. It has appeared desirable on this account to take stock of the progress made along the lines of research included in the agreed programme rather as a record of the work done under the specific items contemplated than as a quasi scientific summing up of any broad results obtained. It is a record of contributions to several great investigations, designed to show how far it has proved practicable to carry out the work intended, and in this way to assist in planning further work. Attention may be drawn however to the great attention paid in the Committee's work to lines of research which cast light on the magnitude and nature of fluctuations. Age determination, to take but one instance, is being used in several species for the purpose of tracing back the existing stock to its dominating broods, and where for a given stock, as for instance the English cod, existing methods have not proved easy of application or have yielded results which have not seemed obviously reliable, efforts are being made to arrive at more suitable methods. The utility of ability to explain the existence of fluctuations of abundance and possibly to forecast them, and the

advantages of an increased accuracy of knowledge of fluctuations as a background against which the study of effects of fishing can be built up are too obvious to need statement. Such investigations as do not appear immediately to deal with questions of stock, as for instance those into the feeding habits of fish are nevertheless clearly among the first steps to an understanding of both growth and movement and so bear indirectly upon the same problems. The lines of research most pressed at present appear therefore well calculated to yield ultimate results of the highest practical importance.

The Chairman wishes to express his sincere thanks to the members of Committee, who have kindly sent him summaries of the work done in their countries. In accordance with the decision reached at the last meeting these summaries are not reproduced, an attempt being made to re-arrange the information they contain so that the progress made in all countries in the execution of any given item of the programme may be seen.

In view of the publication of bibliographic notices in the Journal of the Council lists of works published in the various countries represented on the Committee are discontinued.

Fish.

General.

Statistics & Ichthyometrics. The collection of Statistics was carried on as in recent years. A change in the method of selling has resulted in an increase of accuracy in the Belgian statistics of sprats. A large proportion of the North Sea catch of the chief food species made by the several types of English and Scottish fishing vessels were referred to the rectangles recognised by the British fishery authorities for the purpose of Statistics.

The measurements of unselected samples of the catch of commercial fishing vessels at sea, and of samples of market categories on shore was continued by England: the numbers of the various species recorded were as follows:—

Numbers of Fish Measured July—Dec. 1926.

At Sea				On the Markets				Total			
Plaice	Haddock	Cod	Total	Plaice	Haddock	Cod	Total	Plaice	Haddock	Cod	Total
237010	249876	37297	524183	25339	18752	6424	50515	262349	268628	43721	574698

The haddock measurements were put at the disposal of the Scottish investigators.

Food of Fish. The determination of the food of fishes has been continued. In Germany particular attention was devoted to the food of plaice, and secondly of dabs, also other fishes being investigated. Examination of stomach contents was made by all countries represented on the Committee as opportunity permitted.

The extensive English operations were continued. The ultimate objects of these investigations are:

1) The correlation of the growth rate of fishes on the various grounds with the contents, considered both qualitatively and quantitatively, of the stomachs of the several species and of their various size groups.

2) The search for correlation between the food of fishes and their migrations.

3) The determination of species which are competitors with valuable food species for the same food.

4) The comparison of the stomach contents of the fish with the Benthos found on the ground on which they are taken.

5) The collection of information afforded by the stomach contents as to the life history, distribution and fluctuations in abundance of the benthic species of importance in relation to food fishes.

The method adopted is as follows: —

The fish are divided up into 5 cm. lengths and the number in each 5 cm. length with stomachs containing food (even traces) and empty, is determined. The volume of each species of food in the stomachs containing food is estimated volumetrically by water displacement. Unidentifiable remains, unless obviously different to the general stomach contents, are "spread" over the identifiable matter. As far as possible 100 food-containing fish, plus the number of empty stomachs proportional to that sample, is aimed at for each 5 cm. length in each haul or group of hauls on any ground.

The main work is being controlled by:

(a) Investigation of the diurnal variations in stomach contents, and
(b) Investigations as to rate at which food is passed out of the stomach.
(c) Observations on contents of other parts of alimentary tract.

(b) is being carried out statistically by means of successive hauls of various lengths, in order to check the relative average food content in the stomachs of fish that have been in the trawl for various periods. Work under this head is, of course, in close conjunction with work under (a) and (c), especially the former.

During the six months nearly 3,000 fish were examined.

Littoral Fishing. The intensive examination of the catch of vessels fishing close to the Belgian coast, which has been carried on for many years, has been continued. This has been rendered necessary by the adoption of motive power in the fishery, and the great increase in the catch of small fish which has resulted.

Experiments with Savings Gear. Some further work was done on this question, but owing to the dislocation of programme caused by the coal strike the full amount contemplated in England could not be carried out. Trawling experi-

ments were made on one cruise with the Trouser Trawl, having a "kite" mesh in one leg; no very definite conclusions could however be drawn, and further hauls are necessary before a considered opinion on the effectiveness of this mesh can be formed.

Cod.

In England a close study has been made of the methods of age determination of this fish. The collection of cod scales started in the winter of 1924—5 was continued until July 1926, when it seemed quite certain that the unknown period in the life cycle between the egg and the smallest marketable fish, had been bridged. The examination of these has led to a restatement of the scale theory in terms of measurable quantities, with some modification of currently accepted views. A report on the whole matter is in preparation, but a preliminary account of the method which may prove to be an important advance, has appeared[1]).

The technique of marking small round fish has been studied experimentally in the tanks at the Dove Marine Laboratory, Cullercoats, where facilities have been granted by Professor Meek. All types of mark tried, including several from foreign correspondents, have proved unsatisfactory in that only a small proportion remain attached to the fish, even at the end of nine months. Attempts at improvement of the pattern of label and mode of attachment are being made. As the results obtained so far however are inconclusive no marking experiments have been carried out at sea.

The stomachs of 400 cod taken on the ground off Flamborough Head were examined.

During the winter months the French investigators observed codling passing along the coast of the Pas de Calais. These ranged in size from 18 to 32 cms. They were feeding chiefly on fish and Crustacea, the species found in 127 specimens being *Ammodytes sp.*, *Carcinus maenas*, *Porcellana longicornis*, *Portunus holsatus*, *Galathea sp.*, *Palaemon serratus*, *Crangon vulgaris*, *Talitrus*, *Chtalamus*, *Eupagurus bernhardus*, *Arenicola*, *Ophiothrix fragilis*.

It will be seen that of the seven lines of research approved at the last meeting of the Committee (Rapp. et Proc. Verb. Vol. XLI, p. 56, 57) contributions were made to numbers 2, 3, 4, and 7.

Haddock.

The measurement of haddock at sea and on shore was continued (E), records of a quarter of a million fish being obtained and sent to Scotland. It is hoped shortly that observations on haddock will be practicable from French vessels, which are extending their operations into the North Sea.

[1]) Graham, M. A precise method for determining the first "winter" zone in cod scales. Journal du Conseil International pour l'Exploration de la Mer. Vol. I, No. 4. 1926.

Herring.

All the lines of research in the Southern Area connected with herring have received attention, the work being carried out by Denmark, England and France. It will be convenient to group the record of progress made under the several items undertaken.

1) Yearly and monthly statistics as to landings have been continued (E, v. s. p. 125).

2) Investigation of unsorted samples of known place and time of capture. In France samples were examined from both the North Sea and the Channel. A feature of these samples was the predominance of herrings of 5 winter rings to their scales; a large proportion also had 4 winter rings. In England eleven North Sea samples and two Channel samples as well as five from the western fishery based at Milford Haven were dealt with, the last mentioned being trawled herring. This period completes the fourth successive season of the East Anglian fishery which has been examined and a paper[1]) on the results has been published in the "Journal du Conseil". It was found that there was an annual return of the old fish to the grounds off the Norfolk and Suffolk coasts, and that fish which formed the bulk of the catches in 1923 were still playing an important part in 1926. A feature of the catches of 1926 was the large number of 5 year old fish present in every sample. These are from the winter spawning of 1921—2, when the catches were very poor and the quality of the herring was bad.

3. Distribution of young herring. The 0 Group appeared among the sprats taken along the southern part of the continental coast (F.B.) they were found off the sector from Dunkirk to Calais in December and January. Young herring constituted from 10 to 20 % of the catch by number, and ranged in length from 9 to 15 cms., the majority being 10 or 11 cms. long; those of 13 and 15 cms. bore one winter ring. Sprat samples landed in Belgium also contained a considerable proportion of herring. One only of the English samples was examined for herring before despatch, and was found to contain only 3 % of these fish.

4. Rate of Growth. Work on the growth of the Southern North Sea herrings seems to show that the year 1926 was a poor growth year. Three separate year-classes are under examination at present, and in each one the 1926 period showed poor growth (E). The growth rate of herrings taken by French fishermen is under examination (F).

5. Study of Herring Races. The French herring season proper terminates about the second fortnight in January. Nevertheless, it has been found possible to secure samples from the Channel at various seasons of the year, and these are under examination for racial differences (F).

[1]) Hodgson, W. C. The East Anglian Autumn Herring. Journ. du Conseil, Vol. II, No. 1. 1927. pp. 69—74.

Six samples have been examined in England for racial characters. These came from Cromer Knoll and Smith's Knoll areas and include fish of maturity stages IV—VI.

While it was noticed that there was no apparent difference in the number of vertebrae between the spawning fish from Cromer Knoll and the "full" fish of Smith's Knoll, it would be unsafe to give definite conclusions at this stage of the investigation.

6. Location of spawning places. On the stretch from the Dogger Bank to the Little Fisher Bank, the Jutland Bank and the west coast of Jutland between 56° and 57° N. Lat. observations were made by Denmark from commercial fishing vessels regarding the occurrence of herring eggs in the stomach of haddocks in the period September—December. Samples of the stomach contents were also collected for further examination. No herring spawn was observed this year.

In the beginning of October 1926 some fishing experiments with the stramin ringtrawl were carried out in the Jutland Bank Area, in order to catch the tiny herring larvae. Only very few specimens were caught.

Young herring larvae were found in abundance by French vessels engaged in research in the neighbourhood of the western end of the Dogger Bank in October; namely on Oct. 3rd at 54°44′ N. 1°18′ E. and on Oct. 7th at 54°35′ N. 1°15′ E. These larvae ranged from 6 to 11 mm. in length and at the latter position were accompanied by large quantities of *Limacina retroversa*.

In connection with spawning grounds it may be remarked that the spawning herrings appeared on the spawning grounds of the south of the North Sea (Sandettie—Dyck) and to the east of the Channel (Bassurelle, Vergoyer—Bassure, Batture, Bassurelle de la Somme, Ecamias and Ridens de Dieppe, and Antifer) from a week to a fortnight later than is usually the case.

7. Investigation of food of young herring. Fishing experiments with the stramin ringtrawl were carried out by Denmark in the Horns Reef area in the autumn of 1926 in order to catch young herring for investigations as to their food.

Twelve thousand herring stomachs were collected by English investigators on the herring fishing grounds lying along the English east coast, and their contents are now under examination.

Further work bearing on the food of herring appears under the section on Plankton.

In addition to the work dealing with the biology of the herring and its ecology summarised above, observations were made by the French staff on the relative advantages of the principle methods of fixing up herring drift nets and as to the possibilities of herring trawling in certain localities. Meteorological observations were also taken for correlation with the catches obtained by the fishing fleet (F).

Plaice.

The researches on the plaice have been continued, both those of a strictly biological character and those bearing more or less directly on the economic aspects of the plaice fishery. Progress under the various items of the year's programme may be summarised as follows:

1. Ichthyometrics and detailed statistics. The market statistics have been collected as before, the British steam trawler catches being referred to localities of capture and distinguished as to the three main categories of large, medium and small into which the classes of plaice recognised on British markets are grouped. The measurement of plaice has been the chief task of the English fish measurers employed for work on commercial fishing vessels, the numbers dealt with being given above (v. s. p. 25). In addition plaice have been measured on research vessels in the course of particular researches. Thus in continuation with many previous comparable trawlings undertaken at the same stations in the vicinity of Heligoland in the past with a view of gauging the fluctuations of stock Germany measured over 10,000, and from the sections mentioned in a later paragraph 15,500 plaice, while over 4,700 were measured on the English vessel from the waters within the 15 fathom line off the Continental coast.

2. Age determination. This has been vigorously pressed, 6,376 otoliths being examined in England and 3,600 in Germany.

The English sea work was carried out in November, when otoliths were obtained as follows:

Position	No. of Plaice otolithed
Off Ymuiden	613
Skiermonikoog	1253
Near Heligoland	450
Off Sylt	1036
Near Sylt	288
Horn Reef	420
Graa Dyb	385

In addition a commencement was made at the examination of the age composition of the various Trade Categories of plaice, with a view of interpreting the main statistics and of studying fluctuations. All the fish treated were landed at Lowestoft between July and November. The numbers dealt with were: 221 otoliths of "Best Medium", 269 of "Small Medium", 527 of "Best Small" and 914 of "Dead Small". It was not possible to determine the average length of plaice of each age group from this material since it was inadequate for the purpose. It was found that "Best Medium" consisted mainly of female plaice of over seven years while the other categories which are all included as "Small" in the statistics of the Ministry of Agriculture and Fisheries were mainly fish of less than seven years old. The

data obtained were applied to the landings at Lowestoft for the month of October; both by weight and number plaice of five and six years of age predominated.

A report on the age investigations has been completed and will appear shortly.

The German material was collected at two sets of stations, namely 2,200 otoliths from the vicinity of Heligoland in strict comparability with other collections obtained in 1903 and subsequent years, and 1400 otoliths taken at stations along the sections examined in post war years as a contribution to the survey of the continental nursery grounds off the German coast, and in particular of the areas whose closure was recommended by the Council. These collections have been the subject of reports[1]). The examination of this material has shown the great prominence of a single year group, namely that of 1922, in the existing stock.

The arrangement of the sections trawled (lines from Norderney, Borkum and Hever were worked during the periods dealt with in these reports) permits of the utmost use being made of the observation, and in addition to affording information as to the size and age composition of the stock present in the area studied, the results, when collated with similar investigations of the same type in other post war years, constitute a useful method of approach to the study of migrations. Work of this character bears directly on the late proposals of the Council for the protection and improvement of the plaice fisheries, and if conducted on an adequate scale is of a type which possesses great practical importance in the study of both that and other proposed measures of improvement.

It is impossible to regard the work on age determination as divorced from other lines of work dealing with stock, and as in other species it lies at the root of the study of fluctuations, growth, and the possibilities of depletion. Further reference to it will be found therefore under other items of the work on plaice.

3. Investigation of the younger stages. Investigations were made by Germany on the density of 0 Group plaice on the Danish method and with the same gear. The form of the coast line and the strong tidal streams rendered the work difficult, but 3,500 plaice (nearly all of 0 Group) were taken, and stations chosen for repeated examination in future years.

4. Food of plaice. The objects and methods of the English work on the food of fishes has been outlined above (v. s. p. 125). During the period covered by the report 1845 plaice stomachs were examined, all from the grounds along the continental coast.

New material was obtained in Germany in connection with the cruises of the research ships. The examination of the material collected since 1923 was continued, the results being collated with those of the Benthos work (v. i.) and

[1]) Bückmann, A. Vorwiegen des Jahrgangs 1922 im Schollenbestande der Deutschen Bucht. Journ. du Cons. Vol. II, No. 1. pp. 53—69.

Ibid. Weitere Untersuchungen über Schongebiete für die Scholle in der Nordsee. Ber. der Deutsch. Wiss. Komm. für Meeresforschung. N. F. Bd. III, H. 1

with those drawn from the examination of the food of other species, particularly of dabs.

5. Rate of growth. An attempt has been made in England to compute the average growth of plaice during the summer of 1926 by comparing the mean sizes of certain age groups in May and November. The plaice caught at the most inshore station of the Leman—Haaks line in May were compared with those obtained at a similar distance from the coast off Ymuiden in November. The difference in size of plaice of the various age groups in the two samples was very small, indeed apparently little more than 2 cms. had been added to the length of the fish during the summer. The proportions of the plaice of each age group however varied greatly in the two periods. The November sample contained a higher percentage of the I and II Groups and fewer older fish, and it is probable that the later sample did not represent the stock found in May, the older individuals presumably had moved offshore; and only a remnant remained, supplemented by the I and II Groups which had either grown to a sufficient size for retention by the trawl or had moved out from more immediately inshore waters.

The other two comparisons were in the vicinity of Horn Reef and Graa Dyb. Here the growth evidently had been rapid, particularly in Graa Dyb, where at certain ages it amounted to an increase of 7 cms. in length.

The relative abundance of plaice at these positions cannot be judged accurately from so few hauls. It was noticeable however that the population was very dense off the Danish coast in the summer, though owing to slight differences in the gear used at the Haak's station in May no comparison is possible. The cause of the difference in the growth rate is unknown, the question still being under investigation.

It is noteworthy that at all stations the III Group was less numerous than the IV Group.

6. Savings gear. This is mentioned above (v. s. p. 26). Taking the plaice work as a whole, it will be seen that attention has been given from many lines of approach to the factors affecting the amount of the stock available for fishing: development of such investigations will it is hoped ultimately lead to ability to forecast roughly the prospects of the fishing and assist also in the evaluation of the effects of fishing on the stock.

Other Fish.

The measurement and examination of stomach contents of fish taken in the course of the observations at sea has been general, as in the past, and the determination of sex and maturity has been made in several species. Among them may be mentioned haddock, whiting, soles, turbot and brill. Material for age determination was obtained in some species. (*R. clavata* and *R. batis*) were the subject of particular attention in Germany. Three species call for detailed mention.

Sardine. Large sardines appear off the coast in the vicinity of Boulogne, where they are known as "Cèlans" or "Cèlins", at the end of the herring season. A comparative study of these fish with the pilchards of the west of England has been commenced (F).

Sprats. Both Belgium and England have forwarded to Dr. Bjerkan samples of sprats for his examination, 28 samples from Belgium and 3 larger samples from England; and this fish has been studied also in France.

Dr. Bjerkan has not yet examined the English samples. The Belgian, taken between Nov. 26 and Dec. 28 consisted of about 80 % of the year class 1925, about 10 % of that of 1926, and 10 % of the classes of 1924 and 1923 together; concerning these proportions he says:

"The condition at large for the run of sprat during November and December 1926 at Ostende seems to be about the same as during the autumn fishery at our coast, the percentage of older sprat being however somewhat higher at Ostende.

It is interesting to note that the year-class 1925 was so dominant during the large sprat fisheries at Ostende this winter. At the West Coast of Norway especially North of Hardanger the year-class 1925, the one year old sprat, was not very abundant last season, the older sprat (especially the year-class 1924) making itself more felt than usually being the case. Only for some three weeks in the Ryfylke fiord the year-class 1925 was abundant and gave the occasion to a very good fishery".

The mean lengths of the year classes named were 1926, 7.0 cms.; 1925, 10.8 cms.; 1924 and 1923, 13.1 cms. The length of the 1926 fish while above that of the same group on the south coast of Norway early in September is in some years equalled by Norwegian sprats of the same age. The mean length of the 1925 fish however was half a centimetre above the best years fish of corresponding age in Norway.

Length, age and maturity of sprats were examined in France. In the period covered their length varied between 8 and 15 cms., the majority being between 11 and 13 cms. Those of 12 cms. showed two winter rings on their scales. Most were at Hjort's Stage II of Maturity.

Tunny. Attention is drawn to the renewed presence of tunny in the North Sea by France. French fishermen have taken as many as 65, of from 150 to 225 kg. in weight on Brucey's Garden, a fishing ground west of the Dogger Bank. The French investigators consider the fish to be drawn by the herring shoals. They point out, however, as a result of observations during the herring season that in the western part of the North Sea it does not penetrate water of a lower temperature than 14° or of a less salinity than 34 ‰. This is the more worthy of remark since as they point out, the occurrence of tunny south and west of Norway and even as far towards the Baltic as the Belt show that reactions to either salinity or temperature are not marked during the period of dispersion.

Plankton.

In accordance with the programme agreed, the plankton work has been directed to definite investigations relative to the food of fish.

In England they were related to the herring. Following the southward movement of the herring, plankton samples were collected on three further cruises during August, September and October. Certain biochemical data were also obtained which indicate, so far as they go, a qualitative difference in the chemical composition of the plankton coincident with the southerly migration of the herring; the indications thus afforded are being pursued. On the August cruise 32 stations were worked along four lines, 10 miles apart, and roughly parallel with the coast, extending from the Longstone Light Vessels to Flamborough Head, with a line of stations from the S.W. patch of the Dogger Bank to Lowestoft. In September the same area was covered, and 25 stations were completed; on this cruise the microplankton was very rich, being composed almost entirely of Peridinians except in the region from the S.W. patch of the Dogger Bank to the Outer Dowsing L.V. where *Rhizosolenia styliformis* was very abundant. Large catches of *Limacina* also were caught with the coarse-meshed international net. By the time that the October cruise took place herring fishing was concentrated off East Anglia and the bulk of the plankton stations were made in this area, the remainder being along two lines extending as far north as Lat. 54°45′. 22 stations were worked. Each cruise was arranged so that the fishing area at the time was completely sampled. Vertical hauls were made at all stations with both the fine and coarse-meshed international plankton nets; in addition horizontal hauls at each 10 metre depth were made with the coarse net at alternate stations and oblique hauls with the Petersen Young Fish Trawl at the intervening stations. Samples of herrings from commercial vessels were collected continuously throughout the season for the examination of stomach contents (see p. 129).

Collections of plankton were made on the herring grounds by masters of Dutch herring drifters, and comparison of these samples side by side with the catches of herring made at the same time gives reason to hope that plankton may be used as an indication of the prospects of good or bad catches at the spot at which it is taken. The mean catch of 95 shots with simultaneous plankton collections was 19 kantjes. The mean catch from shots accompanied by orange, red, yellow or brown plankton was 25 kantjes, from those with no colour 6 and from those with green plankton 8 kantjes.

France collected 32 samples at various stations on the herring fishing grounds. Attention in Germany was directed mainly to the working up of material already collected, particularly to the larger forms such as Medusae, Sagittae, Schizopods, Amphipods and their relationship.

Benthos and Deposits.

Denmark has conducted comparative experiments[1]) with the Knudsen bottom sampler[2]) and the Petersen Grab. These experiments were carried out on sandy bottom in the Graa Dyb and the waters west of Faroe in December 1926. From these and other experiments the conclusion was drawn that the Knudsen bottom sampler when used on sandy bottom not only brings up a far greater bulk of bottom material than the Petersen grab, but also a far greater quantity of bottom invertebrates per unit of surface.

The German work on Benthos was a contribution to the quantitative survey of the commoner species occurring in a definite area of the German Bight. The area chosen measures about 200 square miles, is off the East Frisian coast, and is intensively examined, 110 stations being worked with the Petersen grab. This work was inaugurated in 1922, and is carried out in various years and at various seasons. It may be added that work on oysters of the North Frisian shallows, and examination of the Heligoland lobster stock was carried out during the period; but this is not as a definite part of the international investigations.

Hydrography.

The progress made may be summarised under that carried out by means of research vessels and by other means.

In the first of these item 2 of the programme does not fall within the period covered by this report and the tests of a Densimeter, item 3 have not yet occurred. The work under the remaining items is as follows:—

Research Vessels. 1,5. Salinity and temperature observations. These were made during seven cruises of the English vessel in the months of July—October, in connection with the plankton and cod investigations, and the results will appear in connection with these researches. The stations worked were for the most part in a wide area lying along the English coast, though for some purposes more easterly cruises were made. The French fishery patrol vessels made 37 stations in the North Sea, and took temperatures at various depths over the herring grounds. Hydrographic data secured by the German vessel in the course of her various fishery cruises were handed over to the Deutsche Seewarte. Daily temperature and salinity observations were made in the Heligoland Roads as well as fortnightly observations further offshore.

4. Drift Indicator. Such few opportunities as the English investigators found for the use of this instrument were utilised. The chief use to which it was put however was from Light Vessels (v. i.).

[1]) Johansen, A. C. Preliminary experiments with Knudsen's bottom sampler. Medd. Komm. f. Havundersøgelser, Serie Fisk. Bd. VIII, No. 3.

[2]) Described Knudsen, M., A bottom sampler for hard bottom. Ibid. Bd. VIII, No. 4.

Other Vessels. Surface observations of Temperature & Salinity.

1. The following routes have been worked by England:—

Route	Approx. frequency of sampling
Shields—Oslo	9 samples a week
Hull—Hanstholm	do.
Newhaven—Dieppe	3 samples a week
Southampton—Havre	5 & 4 samples in alternate weeks
(in the English Channel Area)	
Southampton—St. Malo	5 & 4 samples in alternate weeks
Plymouth—Guernsey	do.
Liverpool—Charente	9 samples a fortnight
(under the supervision of the Marine Biological Association, Plymouth)	
(in the North Atlantic)	
English Channel—West Indies	30 samples a month
English Channel—South America	do.

Holland has taken salinity and temperature observations along the routes Flushing—Folkestone and Rotterdam—London.

Observations have been made also at lightships on every fourth day:—

Smith's Knoll, Varne, Seven Stones (in the English Channel Area) by England, and from Terschellingerbank, Haaks and North Hinder by Holland, — which country has in addition made records of temperature only from Maas and Schouwen Bank.

Temperature observations were made from Dutch herring drifters while fishing, and these are being collated with the catches.

Tests with an instrument designed to facilitate and improve the collection of surface samples from ships underway are almost complete, and it is proposed to make the use of this instrument general throughout the English work as soon as trials have shown it to work with the requisite reliability.

2. Observations have been taken from the Smith's Knoll, Varne and Seven Stones Light Vessels every fourth day.

Work with Current Indicator.

3. Without cessation, continuous observations upon residual currents have been made with Drift Indicators on the Varne and Inner Dowsing Light Vessels (E).

The records from these Light Vessels are under examination, and a report upon them will appear shortly.

TRANSITION AREA

July—December 1926.

By

A. C. Johansen.

In the latter part of the year 1926 the following countries participated in the international marine investigations in the Transition Area: Denmark, Germany, Norway, and Sweden. The investigations have been mainly concerned with plaice and herring stocks, but several other kinds of fish of important economic value have also been the object of investigations, such as for instance the cod, haddock, flounder, dab, and turbot. Both Danish and German investigators have carried out valuation of the sea bottom and plankton observations, and hydrographic investigations have taken place in conjunction with the biological work.

At the meeting of the International Council in Copenhagen September 1926, the programme of investigations in the Transition Area was reaffirmed, as is given in Rapports et Procès-Verbaux, vol. XLI, p. 74—79.

The following work has been carried out in the latter part of the year 1926 in the Transition Area by the various participating countries:—

Denmark.

The Research Vessels at disposal for the investigations were the following:—
s.s. "Dana": for some days at the beginning of October 1926.
s.s. "Japetus Steenstrup": during the summer and the autumn up till October.
A motor boat belonging to the Fishery Board: from the 3rd to the 14th of August.

Plaice Investigations.

By fishing experiments from motor boat with fine meshed plaice-trawl in August 1926 it was found that the 1926 brood was very sparsely represented, whilst the catch of I Group confirmed the view that the year 1925 had been a far better survival year.

Fishing experiments with push net in the summer of 1926 along the Baltic coasts and round the coasts of Sealand, Møen, Falster, and Bornholm showed that the plaice 0 Group was much less abundant than in 1925.

Fishing experiments with fine meshed plaice-trawl in the Belt Sea and the southern Cattegat in the summer and autumn of 1926 proved that the 1923 and 1925 broods were comparatively numerous in the catches, whereas the 1924 brood was only poorly represented.

Herring Investigations.

By fishing experiments with ring-trawl the frequency of the larvae of the autumn herring was investigated at the end of September and the beginning of October. In the region between Sealand, Møen, and Skaane considerably less larvae were found than in the autumn of 1925. In the region between Møen-Falster and Darss there was less difference between the amount of fry in the two years. In the Sound were found as in 1925 only few herring larvae.

In Smaaland Bay and the adjoining regions of the Great Belt were found considerable masses of newly-hatched larvae in the first half of October.

In the eastern Cattegat a few fishing experiments were undertaken with ring-trawl at the beginning of October. The number of larvae was considerably less than in 1925 and 1923, but at the most northern station (off Trindelen) a comparatively large number of larvae were taken.

Herring from the Baltic and the Belt Sea were examined with a view to age determination and investigation of race.

Haddock Investigations.

Haddock occurred, as mentioned in the previous report, in unusually large quantities in the Belt Sea in the winter of 1925—26, the overwhelming majority being of the 1923 brood, which had already as larvae been carried into these waters by the strong inflow of salt water in the spring and early summer of 1923. At the beginning of the winter of 1926—27 a number of haddock were still found in the Belt Sea. It was observed by analyses in the months of January and February 1927 that the majority of these belonged to the 1923 brood, and that they were nearer maturity than the adult haddock in the Belt Sea at the same season in 1926.

Many specimens of maturity IV—V were observed and a few (both male and female) of maturity VI. Up to 40 ccm. of running roe were squeezed out of some female specimens. The salinity of the bottom water during the above mentioned months was approximately normal. It is not yet known whether haddock larvae have developed in the Belt Sea in the beginning of 1927.

Valuation of the Sea Bottom.

In the waters round Funen and in the Limfjord valuation of the sea bottom was carried out in September with Petersen's Small Grab.

Experiments for the purpose of comparing the capacity of Petersen's Large

and Small Grabs with that of Knudsen's Bottom Sampler for Hard Bottom, which were first carried out in the Sound on April 26th 1926, were continued later in the following places:—

Køge Bay. September 1st—3rd, 1926.
North Sea off Fanø. December 16th, 1926.
Graadyb-inshore-waters. December 17th, 1926.

The results of these experiments were published in the following papers in "Meddelelser fra Kommissionen for Havundersøgelser". Ser. Fiskeri. Vol. VIII. No. 3 & 4. 1927.

Martin Knudsen: "A Bottom Sampler for Hard Bottom".
A. C. Johansen: "Preliminary Experiments with Knudsen's Bottom Sampler for Hard Bottom".

Plankton Investigations.

Plankton collections with the Hensen Net have been undertaken in the Transition Area, and P. Jespersen has continued the working up of the considerable material previously collected concerning the food of the herring at its various stages of development.

Hydrographic Investigations.

Hydrographic investigations have been carried out in conjunction with the biological work, and information concerning temperature and salinity at the various stations has been sent in to the Hydrographical Department of the Central Bureau.

In the period May—July 1926 there was a very strong inflow of salt bottom water through the Belt waters to the Baltic. In May, June and July the minimum salinity observed at Halskov Rev Lightship (between Nyborg and Sprogø) at the bottom (20 metres) was 26.6, 28.9, and 26.4 per mille respectively, whereas the mean salinity for these months is normally 22—25 per mille. The maximum salinity in these months was 32.5, 33.0, and 32.7 per mille respectively. The inflow can be traced as far as Gedser Rev Lightship, where the mean salinity at the bottom (17 metres) in the months May—November inclusive had the values which are given in the table below together with the normal values. The maximum values for salinity observed during these months in 1926 are also given.

Normal Salinity per mille compared with Mean Salinity and Maximum Salinity at Gedser Rev Lightship at the bottom (17 metres) in 1926.

	May	June	July	Aug.	Sep.	Oct.	Nov.
Normal Salinity	15.4	15.4	15.5	15.0	13.0	12.2	12.5
Mean Salinity 1926	16.4	17.1	19.8	18.6	16.0	14.2	11.6
Maximum Salinity 1926	21.5	22.6	24.3	24.5	21.0	18.1	14.5

The highest values for salinity were thus observed here in July and August, whereas at Halskov Rev they occurred in June.

The strong inflow through the Belt waters occurred at that season of the year when the salinity of the bottom water of the southern Cattegat normally reaches its highest values, i. e. in May, June and July.

The inflow can be traced from Læsø Trindel Lightship in a southerly direction through the Cattegat by salinity observations at a depth of 20 metres, but the salinity differed from normal to a much less extent than in the Belt waters. In the table below we give the variations from normal in salinity at three lightships in the Cattegat at a depth of 20 metres.

Variations from Normal in Salinity at a Depth of 20 Metres in the Cattegat.

	March	April	May	June	July	Aug.	Sep.
Læsø Trindel	—0.2	*0 9*	*1.5*	*0.7*	—0.3	0.3	—0.5
Anholt Knob	0.8	—0.4	*0.8*	*0.3*	—0.3	0.8	—2.2
Schultz's Grund	1.7	0.9	*1.3*	*1.6*	*1.8*	*0.9*	—2.3

With the strong inflow of salt water in the earlier half of the summer of 1923 a considerable number of haddock larvae were carried into the Belt Sea. Some haddock larvae or fry seem also to have been carried along by the inflow in 1926. In Lille Belt off Fænø Danish fishermen found haddock 10—15 cm. in length, which doubtless belonged to 0 Group.

Germany.

The "Berichte der Deutschen wiss. Kommission für Meeresforschung" contain a survey of the German investigations in the Transition Area from the year 1919 and onwards. The investigations in the second half of 1926 form a continuation of this work. The collection of data, in so far as bottom fish, bottom fauna, plankton, and hydrographic observations were concerned, was made for the most part on a cruise of the "Poseidon" in the Baltic in July 1926 lasting altogether three weeks. The main purpose of the cruise was the investigation of the Bornholm Deep together with the marginal regions, but material was also collected from the Transition Area. The "Mitteilungen des Deutschen Seefischereivereins 1926, Heft 8" contain a preliminary report on the subject from the leader of the expedition Dr. Strodtmann and an article dealing with it has been published in "Der Fischerbote" 1926, Heft 19.

Dr. Strodtmann together with his assistant Dr. Heidrich continued the researches on bottom fish set on foot in the western Baltic in 1921, and extended them so as to include Gadidae also. The plaice has appeared more and more rarely in recent years in Kiel Bay. The cruise of the "Poseidon" enabled some supplementary observations to be made on the occurrence of large specimens and

on their growth. The investigations in July 1926 of the deep waters West and North of Rügen showed that the average size of the plaice was much greater than in the years 1905—1907, but that the numbers had considerably decreased. Further particulars concerning the economic importance of this fish in the region of Rügen are to be found in Dr. Heidrich's work "The Importance of the Plaice for Flatfish Fishery in the Middle Baltic" (Berichte der Deutsch. wiss. Komm. II, 3). In the region Oderbank-Adlergrund-Jasmund Peninsula (Rügen) there was observed in 1925 an abnormally large number of the 1921 brood, which caused simultaneously a considerable increase in the catches of plaice further east along the East Pomeranian coast.

Flounders and Dabs. Supplementary observations of flounders and dabs were made, especially in the waters off Rügen. These two species also showed in July in the Arkona Basin a considerable increase in average length and a striking numerical decrease compared with the years 1905—1907. In the Bornholm Basin the same facts were established. The "Poseidon" touched on its cruise the most important fishing grounds of this region and issued information respecting the composition of the flatfish stock in the locality and the conditions of life of each species of food fish in midsummer. The cruise provided also a basis for forming a judgment on the effect produced on the flatfish stock by the fishing carried on in these regions. The most striking observations were those made on the variations in the rate of growth of the dab, a fish which has become of considerable importance to commercial fishing particularly in the region of Rügen, but also in the west and also further eastwards along the Pomeranian coast and off Bornholm. There was observed throughout a great paucity of pleuronectidae in the regions West of the Darss-Gedser Ridge. Altogether the conditions confirmed the results previously arrived at.

A considerable part of the second half of 1926 had to be devoted to the working up of previously collected material with a view to an investigation of the pleuronectidae as regards age and growth.

The Turbot has also, like the dab, been put on the market in increasing quantities by commercial fisheries especially in the Mecklenburg Bay and in the Rügen region. In the spring of 1926 it replaced commercially to a certain extent the plaice in the Mecklenburg Bay. The cruise of the "Poseidon" in July permitted the inclusion in the investigation of this valuable flatfish also, in the biology of which there still remain many points to be cleared up. Bone preparations from a large number of specimens of various sizes were made with a view to age determinations. Moreover, investigations were carried out on the distribution of the various size categories and of the sexes, as also on spawning, to supplement the egg investigations carried out concurrently by Professor Dr. Mielck (see below). The above mentioned preliminary report of Dr. Strodtmann provides further particulars. A continuation and extension of this work is necessary.

Professor Dr. Henking subjected to a thorough examination the statistical data yielded by a fishing ground in Kiel Bay relative to the size and quantity of the fish caught there. A publication on the subject is in hand with a view to throwing light on the extent of the fluctuations in the fish stock which have taken place in this region.

Young Flatfish. The investigations of the occurrence of the youngest bottom stages have been continued since 1925. They have been systematically carried out with push net along the shore and with the Johansen Young Plaice Trawl from motor boat, but only in the coastal regions. The investigations in Kiel Bay were conducted by Professor Reibisch who had some more control catches carried out in the second half of 1926. The Deutscher Seefischereiverein investigated the presence of young flatfish stages along the remaining coast as far as East Prussia.

These investigations are concerned with the plaice, flounders, and rhombus species. A report by Professor Reibisch, Dr. Heidrich and Dr. Schubart on the observations made in 1925 will appear shortly. An extension of the investigations so as to include deeper waters was aimed at on the cruise of the "Poseidon", but the results attained in the Transition Area were of little value.

The Cod. The cod has also appeared for some time in unusual abundance not only in the western regions but also in the entire southern Baltic. Large specimens especially are numerous. Observations respecting distribution, size, sex, and spawning made in the regions touched by "Poseidon" in July provide preliminary data for more detailed investigation in the coming year.

The Haddock. The publication of Dr. E. Fischer's work "Das Auftreten von Schellfischen in der Ostsee", Mitteilungen des Deutschen Seefischereivereins 1926, p. 116, and of Dr. H. Heidrich's work "Der Schellfischfang in der westlichen Ostsee", Fischerbote 1926, p. 163, was followed up by a further investigation into the reappearance of haddock in the autumn and winter months.

The Herring. The herring investigations conducted by Professor Dr. Henking and begun some years ago have been continued in the western Baltic. His assistant Dr. Altnöder has investigated data relative to the herring in the entire area, from the Schlei southwards to Travemünde, as also further eastwards along the Mecklenburg coast. The starting point was the purse seine fishery which has arisen during these last nine years.

The Biologische Anstalt of Heligoland took an active part in the biological investigations in the Transition Area. The work carried out on the cruise of the "Poseidon" in April 1925 was continued in June 1926. Preliminary reports on the subject are contained in Mielck's publication "Die Arbeiten der Biologischen Anstalt auf Helgoland in den Haushaltsjahren 1924—26" and others by Wulff, Mielck, Hagmeier and Hertling in the Berichte der D. W. K. Vol. II. N. F., in addition to the above mentioned publication of Strodtmann in the Mitteilg. d. D. S. V. 1926.

Eggs and Larvae (of food fishes). The researches on eggs and larvae in the Baltic were continued by Professor Mielck Heligoland. Numerous quantitative vertical hauls (Stufenfänge) with the Hensen Egg Net, supplemented by horizontal hauls at various depths and with various implements were made throughout the whole area covered by the cruise. Attention was however centred mainly on the region East of the Darss Ridge.

The catches were examined at once on board in fresh condition whenever possible, otherwise they were preserved. In order to study the capabilities of development the hatching out in glasses both of fished up eggs and of artificially fertilized eggs was successfully attempted on board. Eggs lying on the bottom were likewise secured by means of the old Hensen Sledge Net (Double Dredge) and a recently constructed, also sledge-shaped, special Heligoland net, which can be employed on both hard and soft bottom. With these implements Professor Mielck succeeded in securing a large number of turbot eggs which had formerly only seldom been taken by the plankton nets. In size the eggs resemble those of the North Sea turbot and are deposited in shallow places where they remain lying on the bottom. Clearly the same thing happens here as on the Oder Bank with regard to the flounder eggs (cf. Report on the Baltic Area). Artificial fertilization and hatching out of the eggs up to the first stage of development were also successful. Turbot eggs were found off Fehmarn and on the Prerow Bank, but were most numerous on Kriegers Flak. In the Hohwachter Bay Professor Mielck was able to establish the presence of mackerel eggs, which had never previously been observed in the Baltic. In the same place were found eggs which most probably belonged to whiting, of which ripe female specimens were also observed.

The quantitative investigations of the bottom communities with the Petersen Bottom Sampler were continued by Professor Dr. Hagmeier. The series of investigations begun in April 1925 was followed by a second series relative to the conditions in July 1926, but a publication of material will not take place until previous results have been supplemented by a cruise of the "Poseidon" which is planned to take place in the autumn of 1927. The material was at once worked up on board. In the western districts the scarcity of flatfish was in striking contrast to the abundance of such bottom fauna as constitutes fish food, at least in respect to the number and size of the specimens. Both in the Kiel Bay and in the Travemünde Bay species of marine animals were seen that formerly were not considered indigenous to the locality.

In order to throw further light on the connection between the nutritive fauna and the habits of the food fish population, in particular the growth and the migrations of the flatfish, investigations of fish food were carried out by Dr. Hertling. The quantitative analysis of these food tests opens up the vista of a possible comparison with the results of the bottom sampler investigations. These researches form a continuation of the similar work undertaken in April

1925 and the material collected is worked up in common with that originating from the Baltic Area.

Plankton. The study of Baltic plankton was likewise continued by Professor Mielck in July 1926. It was concerned mainly with the species which are of importance when considered in relation to fish fry (enemies, food). Moreover, in the composition of the plankton could be observed the influence of the abnormally strong inflow of water from the Ocean and the Skagerack which has been observed for several years. Professor Mielck found siphonophores, sagittas, and copepods of ocean origin — or at least originating from the Cattegat — quite close to the Darss-Gedser Ridge, where there prevailed, it is true, a salinity of nearly 30 per mille in the deep water at the time of the investigation. In the upper water, which at the same time owing to a continuous east wind showed a salinity of only 7—8 per mille, were found in contrast to the above living creatures from the eastern Baltic (Aphanizomenon).

Further material was also secured on the cruise of the "Poseidon" in July in order to continue the study of Nannoplankton which Dr. Wulff is making with the aim of examining the connection with hydrographical influences, in particular the gas content of the water.

Hydrographical Investigations. The hydrographical work carried out on the Baltic cruise in July 1926 served mainly as the necessary basis for biological investigations. In addition to this however it forms a link in the chain of a more extensive investigation of Baltic hydrography which was begun in 1922 and was continued in 1924 and 1925 on longer cruises through the southern and middle Baltic (round Gothland). The main object of this work was to obtain further information concerning the interchange of water between the various Baltic basins especially in the deep water layers. Particular use was made of information resulting from the study of the composition of air dissolved in water. It had been found particularly desirable to test as frequently as possible the hydrographical conditions in the various basins by choosing certain characteristic stations. In July 1926 it was found that the inflow of very salt water from the Cattegat into the western Baltic was particularly strong shortly before the observation period and during the observations proper. In Fehmarn Belt a salinity of about 30.15 per mille was observed at a depth of 27 metres. In the Kadettrinne the salinity of the bottom water was found to reach the abnormally high figure of 28.12 per mille. The very salt water had not yet penetrated into the Arkona Basin, the salinity at the bottom being only approximately 15 per mille.

Norway.

The investigations of the Sprat (*Clupea sprattus*) and the edible Crab (*Cancer pagurus*) in the Skagerack have been continued. On these investigations the following papers by Paul Bjerkan have been published:—

1) "Brislingeundersøgelser 1925". "Aarsberetning vedk. Norges Fiskerier". 1. hefte 1926.
2) "Undersøgelser over Krabben (*Cancer pagurus*)". ibid.
3) "Den spiselige Krabbe (*Cancer pagurus*)". "Norsk Fiskeritidende". Jan.-Febr. 1927.

Sweden.

Investigations took place from the Research Vessel "Skagerak" in the Archipelago of Bohuslän from the 15th to the 24th of September and in the Cattegat and the southern Baltic from the 4th to the 24th of October.

From the 23rd of October to the 5th of November a cruise was also made with the Research Vessel "Eystrasalt" in the southern Baltic and in the Sound.

Herring Investigations.

During the above mentioned cruises with "Skagerak" and "Eystrasalt" herring larvae were collected from many stations in the Cattegat and the southern Baltic, and some fishing experiments for herring with drift nets were also carried out between Møen and Skaane.

Scales of herrings were taken with a view to age determination.

Plaice Investigations.

The investigations of the fluctuations in the plaice stock have been continued in the fiords of Bohuslän and in the southern Baltic. Numerous measurements have been taken and age assessments carried out. In the southern Baltic the investigations have been made especially with a view to the question of protection of the plaice.

Previous researches into this question have been dealt with in Arvid R. Molander's recently published paper: "Recent Swedish researches into the fish population of the southern Baltic". Svenska hydrografisk biologiska kommissionens skrifter, ny serie: biologi. Vol. I. No. 2.

Haddock Investigations.

Statistics, dealing with the relative numbers of the various size categories, have been made from the catches brought in to the fishing harbour of Gothenburg and measurements have been taken at different times.

Hydrographical Investigations.

Hydrographical investigations have always been carried out in conjunction with the biological work and the results have been sent in to the Hydrographical Department of the Bureau.

BALTIC AREA

July—December 1926.

By

K. A. Andersson.

Germany.

The investigations regarding the flat-fishes in the Baltic in the second part of 1926 are in close connection with the work of the previous years on the progress and aims of which the reports of the German Scientific Commission for the Study of the Sea give a survey. New material has chiefly been collected on the three weeks' cruise of the "Poseidon" in the Baltic in July 1926. A preliminary report on the results of this expedition — by the leader of the expedition, Dr. Strodtmann — is contained in the "Mitteilungen des Deutschen Seefischerei-Vereins" August 1926. A review of this report will be found in the "Fischerbote", 1926, No. 19.

The Plaice has during the last few years been caught by practical fishing in such numbers in the waters from Rügen eastwards to across the "Stolper Bank" that a great economic importance may be ascribed to this fish also in these areas. Periodically, viz. in the summer months, it was indeed in many places even the most important fish. Numerous catches of the plaice have been made not only by the coastal summer-fishery, but also by the newly started winter-fishery in the "Bornholm Sea". Further details as to this are given in the paper by Dr. Heidrich "Die Bedeutung der Scholle für die Plattfischfischerei in der mittleren Ostsee" (Ber. d. D. W. K. II, 3) and in an article in the July number of the "Mitt. des D. S. V." 1926. No such accumulation of plaice has ever been seen before in these eastern waters; not even in summer. This can partly be explained by the development of the fishery. The fishery has been constantly shifting its ground, moving farther and farther seawards, out to greater depths than in earlier decades, thus reaching stocks of plaice which, though they do not generally appear in any considerable quantity close inshore, do move in from the depths as far as the present fishing grounds. The chief cause for the increase in the catches of plaice in summer 1924 and 1925 has been revealed by the otolith investigations. They showed that this accumulation of plaice is due chiefly to unusually large numbers of the year-class of 1921.

Consequently, the question regarding the new generation or the recruiting of the stock of plaice in these areas again became important. On the cruise of the "Poseidon" in July 1926 the 0 and I Group were not taken in the Bornholm Deep. The next age-group, however, was numerous on the neighbouring banks, chiefly on the shallowest parts of the Oder Bank, but also on the Stolpe Bank. The cruise of the "Poseidon" has made clear the distribution and relative frequency of plaice in the Bornholm Sea and adjacent waters during summer, and procured important material for examining how the stock of fish is influenced or changed through the new fishery recently started there.

Flounder and Dab. The same applies to the flounder and dab, in the deep regions as well as in the neighbourhood of the coast. Comparison with former investigations (1905—1907) showed throughout, for all three kinds of flat-fish, a heavy increase in the average size together with a decrease in the number of individuals. The occurence of young in the districts through which the "Poseidon" passed was likewise studied with positive result. The Oder Bank and the Stolpe Bank, recognised as the nursery of the plaice, are also the habitat of numerous young flounders and turbots. The brood of the dab, however, was only found in somewhat deeper water.

In the interest of practical fishery, looking out for new and more productive fishing grounds, experimental fishing was carried on at the South Middle Bank. Shortly afterwards there has been repeated fishing in this area by fishermen from the coast of Hinterpommern.

A considerable part of the time in question had to be devoted to the preparation of the hitherto collected material on the growth of the pleuronectides.

The Turbot has during the last few years been caught in increasing numbers in the Rügen area. It was also included in the investigations, especially as our knowledge of the biology of this important food-fish has many gaps. On the Oder Bank young turbots were marked and the stomach contents investigated. Further, the bones of a larger number of individuals — of a length of 7—46 cm — were prepared in order to find the most efficient method for investigating the age of this species. These investigations, though exceeding the limits of mere preparatory investigations, still need to be continued and extended. Observations on the relation of sex and stage of maturity supplement the investigations made by Prof. Mielck of Heligoland with regard to the eggs of turbot which were found in great numbers lying on the bottom.

In summer 1925 investigations were started as to the youngest flat-fishes and their occurrence in the neighbourhood of the coast in the middle Baltic. They were continued on a larger scale in 1926 by Dr. E. Fischer.

Cod. The material collected as to frequency and distribution, age-composition, food, sex and spawning conditions serves as preparation for a closer investigation into this species which is intended for the following year. Remarkable accumu-

lations of large individuals at the end of their spawning period have been located by the "Poseidon" in the Bornholm Deep and in the Danzig Deep in July.

In 1926, Dr. Henking's investigations into the Sea-Fishery of Pomerania (east of the Oder) were concluded and published (H. Henking: Beiträge zur Kenntnis der Seefischerei von Pommern [östlich der Oder] in: Berichte der Deutschen wissenschaftlichen Kommission für Meeresforschung, Neue Folge Band II, Heft 2). In this publication, the results of numerous fish-measurements made in different coastal ports in the years 1909, 1911, 1922, 1923 have been stated: the relative proportion in the quantity of plaice, flounder and dab (*Pleuron. platessa*, *flesus*, *limanda*) and also turbot (*Rhombus maximus*) found in the hauls of trawling-nets and the catches of fixed-nets and lines has been defined and the size of the individuals is given in cm. This was necessary, because in former times no distinction was made in commerce between the different pleuronectides, they were only sold under the collective name of "flounder". Only recently has it become usual at the chief markets to separate the species.

The Salmon investigations have been recommenced. The scale investigations are being continued by Dr. Altnöder.

New methods are being tried in order to find an easier and more reliable method of discrimination between salmon and sea-trout.

Poland.

As already stated in last report, Poland has during last year organized the exploration of the sea, especially in the territorial waters. This organisation is proceeding in different directions and the following work has been accomplished during the last period.

I. Biological Studies.

a) Clupeid-fishes.

A study of the influence of the water masses carried by the Vistula to the Baltic Sea, upon the fishery of the clupeids near the Polish coast is published by Mr. J. Borowik.

b) Plankton Studies.

A report on the Phytoplankton from Polish territorial waters was published by Prof. Namyslowski from the University in Poznan.

II. Hydrography.

1) A chart of Polish territorial waters was executed by the Military Geographical Institute. The chart contains detailed information as to the depths and nature of bottom in this part of the Baltic Sea. The changes of depths occurring at

certain points are periodically controlled from the hydrographic vessel "Pomorzanin", belonging to the Polish Navy.

2) The State Meteorological Institute has studied and recorded the formation and movements of ice in the Polish territorial waters.
3) In the new port of Gdynia, preparatory work for the installation of a Mareograph has been accomplished. The new Mareograph will be shortly set up according to indications kindly furnished to the Polish Government by Professor Witting.
4) Daily observations of the temperature of the sea at one point (1 km. distant from Hel) are made by the Marine Fisheries Laboratory.
5) A very detailed study of the quantity of water carried by the Vistula during the last 6 years, made with a view to ascertaining its influence upon the Baltic Sea near the Polish coast has now been completed by Mr. J. Borowik.

III. Statistics.

Detailed statistics of the Sea fishery for 1926 are already finished. From January 1927 figures will be introduced concerning the actual time of fishing and also results obtained in one hour by different fishing apparatus. In the statistical tables, it is intended to replace the calendar year by the economical one.

IV. The saving-trawl.

Experiments are being made by Mr. Borowik and Mr. Dixon with a new model of saving-trawl.

Sweden.

In September—October several cruises were made with the research motorboat "Eystrasalt" in the middle and southern parts of the Baltic for fishery investigations according to the programme adopted. In December, plankton and hydrographic investigations were made from a hired motor-boat.

Herring. A number of herring samples from different parts of the Baltic have been collected and investigated as to size, age and state of gonads.

Larvae have been collected by means of plankton nets.

Sprat. In September and October, the distribution of sprat on the Swedish coast was investigated, and samples were collected for investigation of age etc.

Cod. Samples have been collected for the study of the fluctuations of the year-classes.

Flounder. The stock of flounder was studied at the northern coast of Gothland and otolith samples were collected.

Plankton. In September, October and December, plankton investigations were carried out at a number of stations on a line between Gothland and the Swedish mainland.

Hydrography. In connection with fishing experiments and plankton collections, observations have always been made as to temperature, salinity and oxygen content.

Continual observations have been made from lightships along the Swedish coast and off the north western coast of Gothland.

Publication.

Chr. Hessle:— Sprat and spratfishery on the Baltic coast of Sweden. Meddelanden från Kungl. Lantbruksstyrelsen, no. 262. Stockholm 1927.

Finland.

Biological work:

1) Investigations, mentioned in the last Report, about the coast fishery, have been continued.
2) Material for scale-analysis of salmon has been collected from Kemi-, Oulu-, Kymi- and Kokemäki rivers.
3) Quantitative studies of the fauna at the bottom of the Baltic Sea have been carried out at the zoological station of Tvärminne.

Hydrographical work:

1) Regular continual observations of temperature in the surface daily, salinity at the surface every 5th day, temperature and salinity at different depths every 10th day have been carried out from 26 coast stations and 11 lightships.
2) Observations of currents at the surface, near the bottom and in an intermediate depth have been made tree times daily from eleven lightships, as long as the water has been free from ice.
3) The observations of oxygen in the deeper layers at Märket three times every month have been continued.
4) The results of the hydrographical cruise of July 1926, comprising 66 stations in the Baltic north of Gothland have been worked out and are given to print.
5) Preparatory work for more detailed investigations of the form of the bottom at crucial areas with an echo-sounder have been made.
6) Registrations of the sea-level have been made with mareographs at fourteen coastal points. Two new mareographs in the Finnish bight north of Hogland and in Petsamo at the coast of the Barents Sea are under preparation.
7) Records of the ice conditions in journals and sketch maps have been made at about 100 coastal stations and inlets.
8) Laboratory work comprising studies of the carbon-anhydride equilibrium in the sea and analysis of bottom-samples have been dealt with.

Latvia.

Statistics.

Statistics are regularly continued for 66 districts like in the former years. Data are received about: a) the quantity and the value of fish landed; b) the number of fishermen drowned during their work; c) the value of fishing tackle lost at sea. Also informations are compiled about the number of fishermen and the number and value of fishing tackle (boats, fishing nets, fishing hooks). The data for 1925 are compiled and published by the Ministry of Agriculture in the second statistical yearbook "Bulletin statistique des pêches maritimes de Lettonie. Année 1925". The data for 1926 are ready for publication.

Data of the number of seals killed are collected for all fishing districts.

Salmon investigations.

The collection of salmon scales for scale analysis is continued at the rivers of Daugava (Düna) and Salace (Salis). Experiments regarding the cultivation of salmon yearlings in artificial ponds are continued. Investigations of *Coregonus lavaretus* are continued.

Plankton investigations.

The collection of Plankton from ships along the Latvian seashore, the Baltic and the Gulf of Riga is regularly continued.

Hydrography.

The collection of water samples from ships along the Latvian seashore is continued.

Four coast stations for hydrographical observations (temperature and salinity at the surface and in different depths) are renovated at the Latvian seashore.

A mareograph is prepared for installation at Liepaja (Libau).

Observations regarding the ice conditions have been made from coast stations.

Limnological Committee.

Report on the year's work in accordance with information received at the meeting in Stockholm.

The members of the Committee reported as follows on the work carried out during the past year in their respective countries.

Denmark. Investigations were made on the number, size, and partly on the age, of the sea trout ascending the river Gudenaa. Marking experiments with sea trout were carried out in riverlets on the island of Bornholm.

Finland. The first part of an investigation of the species of *Coregonus* s. str. is ready for publication.

Germany. In the past year a study has been made of the racial characteristics of salmon and sea trout by comparison of the skeletons and scales of these fishes. This work will be continued during the present year. Marking experiments with salmon and sea trout will be carried out.

Great-Britain. Investigations on the fauna and flora of polluted and unpolluted streams were continued. In Scotland, investigations were carried out on the growth and life-history of the salmon and sea trout, especially by the study of scales.

Holland. A Report on "River Pollution and Fisheries" was prepared by Dr. Redeke and presented to the Committee. Dr. Redeke also published a report on the growth of the Rhine salmon.

Irish Free State. A special study has been made of the growth and life-history of the salmon of the River Shannon. Work has been continued on the growth of trout in relation to the environment.

Latvia. Salmon investigations. The collecting of salmon scales for scale reading was continued in the rivers of Daugava (Düna) and Salace (Salis). Experiments regarding the cultivation of salmon yearlings in artificial ponds were continued. Investigations of *Coregonus lavaretus* were continued.

Limnological observations and collection of plankton were continued at three lakes. Data were compiled regarding the distribution of fish for ca. 500 Latvian lakes.

The work on salmon and *Coregonus* will be continued during the present year.

Poland.

1) The study of the life-history of the salmon in the Vistula was organised.
2) Studies concerning the resistance of salmon and trout eggs, fry and young fishes were published.
3) Several thousand of marked salmons, 18 months to two years old were put into the Vistula.

4) The question of the protection of spawning places of the salmon by means of the establishment of a protected natural park was studied and a preliminary accord between Poland and Czeko-Slovakia concerning this question was obtained.

5) A monographic study of the *Coregonus lavaretus* from Polish waters was published.

All this work will be continued in the next year.

Spain. Investigations on Salmon were carried out, more specially by the study of scales.